AMERICAN ARTISAN

JANUARY
★ 1947 ★
DIRECTORY
NUMBER

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

AIR CONTROL

THE COMPLETE LINE OF REGISTERS AND GRILLES

for 1947

TS200
.A7

AIR CONTROL offers you a complete and outstanding line of Registers and Grilles and Ventilators. Smartly styled and exactingly engineered, this compact line has the best products for every application.

AIR CONDITIONING REGISTERS in three designs and two price ranges, featuring the outstanding No. 10 Series with the knob operated Air Flow valve that gives dual adjustable control of the air flow.

GRAVITY REGISTERS in baseboard and sidewall types with removeable face and Air Seal Inner Frame that provides an easy streak-proof installation.

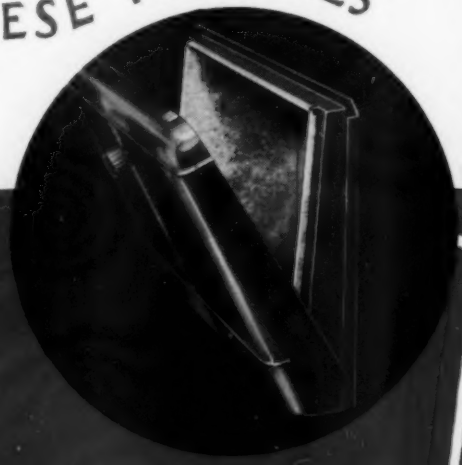
FLOOR REGISTERS and FACES with Rigid-Lock fret construction that results in a better, stronger floor face.

ATTIC and ROOF VENTILATORS in two sidewall types and a roof type for four-way roofs, provide proper attic ventilation. Eliminates rain, insects, etc.

STACKHEAD DAMPERS that provide a better and cheaper method of balancing air conditioning systems.

AIR CONTROL Offers You the Best for 1947

ONLY AIR CONTROL HAS ALL THESE FEATURES



KNOB OPERATED AIR FLOW VALVE

All No. 10 Series Air Conditioning Registers have the Air Flow Valve, a truly outstanding valve that smoothly deflects the air stream with curved air-flow louvers. The knob operator opens with a twist of the wrist.

RIGID-LOCK FRET CONSTRUCTION

The most outstanding improvement in floor face construction in many years. The locking of each fret to the crossing fret results in one rigid unit of exceptional strength.

AIR SEAL INNER FRAME

This outstanding new construction is used on all Gravity Baseboard Registers. Although easier to install, this construction prevents air leakage and streaked walls.

Write today for your copy of Catalog No. 46 or call on your AIR CONTROL Jobber.
LEIGH Building Products are styled and built by AIR CONTROL PRODUCTS, INC.

AIR CONTROL PRODUCTS, INC.
COOPERSVILLE MICHIGAN

Thompson's Restaurant, Cincinnati, Ohio

Amazing New H*AIR* Filter

Costs no *More*—Easy to Sell

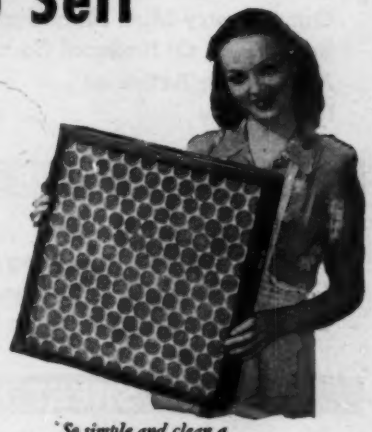
Now you can offer your replacement filter market all the advantages of Wilson's *Natural Hair* filtering at no higher cost than ordinary synthetic filters.

The new Wilson's Spider-Web in its also-new "Honeycomb" casing is a throw-away unit with sales appeal written all over it.

So neat and clean a woman can install it. So efficient you'll get repeat after repeat orders. Acceptance of this new Wilson's unit has been immediate and widespread. Dealers will go to town with it in a big way.

Valuable dealer and distributor franchises are still available. This is your chance to hook up with the leading filter for replacements. Act promptly.

FREE SAMPLE. Write us at once for a Free Sample of the new Wilson's Spider-Web Natural H*AIR* Filter, also complete details and prices.



So simple and clean a woman can install it.

WILSON & CO., INC.
(Air Filter Division)
4100 So. Ashland Avenue
Chicago, Illinois

WILSON & CO. INC.

Look for us in Booth 984, 7th International Heating & Ventilating Exposition, Lakeside Hall, Cleveland, Ohio, January 27-31, 1947

Western States Representatives:—HAROLD WINNINGHAM & COMPANY—SEATTLE • SAN FRANCISCO • LOS ANGELES • SALT LAKE CITY • DENVER • EL PASO

AMERICAN ARTISAN

with which are merged FURNACES & SHEET METALS — Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor

J. J. McCullough, Associate Editor A. A. Kennedy, Assistant Editor

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In This Issue

EACH year AA tries to summarize the production results of the preceding twelve months. This year's summary (page 101) was compiled from somewhat uncertain figures, but we believe is a pretty accurate analysis of what happened.

In line with AA editors' belief that management problems are becoming more important every year, several such articles are in this issue: "Reducing Payroll Taxes" (page 107); "Washington's 1947 Problems" (page 110); "The Warm Air Ass'ns Report" (page 115); "The Nat'l Sheet Metal Ass'n Report" (page 119); "Jurisdictional Awards" (page 120).

Many contractors are asking about aluminum as a duct material; on page 123 AA reports the fabricating and installing practices of two large users of aluminum.

And for those readers who want to know the latest data on new and interesting heating equipment and its possibilities, some unusual ideas are presented on page 128.

Experience is showing that a closed panel is not the complete answer to warm air panel heating. Maybe the industry will finally determine that a combination of warm air panel plus convection heating using the air after it has passed through the panel, is the answer. The design data for such a system is presented on page 141.

Founded 1880

JANUARY, 1947

Volume 116, No. 1

For well over half a century the trade name SAL-MO has stood for quality. Today the latest in new equipment combined with methods developed exclusively by SAL-MO, means the finest in Asbestos Products. The popularity of SAL-MO Products has called for a constant increase in production. Today we are in a position to serve you promptly. Send your next order to SAL-MO.

Your inquiries are invited.

SALL MOUNTAIN COMPANY

ANDOVER 2414 · 176 WEST ADAMS ST. · CHICAGO 3, ILL.

The Editor's NOTE BOOK

Good Grief

STRIVING to improve the leisure time of the American worker, 137 industrial leaders from 19 states and Canada met at Purdue University Industrial Recreation and Music Institute, October 24 to 27. Alan Curtiss, vice president, Scovill Manufacturing Company, Waterbury, Conn., said that "fun-time" activities helped to obtain adequate manpower and that the greatest obstacle blocking a successful program of recreation is the ignorance and lack of understanding between management and employees. Intermingling of "the boss and Joe" in activities of common interest will promote the success of an industrial relations program, he said.

In the opinion of G. Ott Romney, dean of the School of Physical Education and Athletics, University of West Virginia, industrial recreation leaders should regard themselves as "social engineers," rather than mere recreation planners and he urged them to steer people away from entertainment which is not truly and genuinely good.

Personnel work is largely a matter of sizing up how people differ, declared Dr. Donald A. Laird, world famous psychologist. People want to be noticed and generally resent criticism, he said.

He advised supervisors to deal gently with workers and "sugar-coat the bitter pills."

◆

Cut Round Pipe

American Artisan:

Advise me if there is some quick way to cut prefabricated round pipe of 24-gauge to length. In my opinion, a rotary shear with small 13-inch arms should do this, but I seek confirmation and description of the machine.

M. J. C., S. Dakota

Dear Sir:

The various producers and representatives of machinery in Chicago have no suggestions on how round pipe can be cut in any manner better than by the use of a rotary shear with as deep a throat as you can find. We attach tear sheets from manufacturers' catalogs. The shears shown will probably do the trick if you can find one with a deep throat.

AMERICAN ARTISAN

◆

"On the Other Hand"

THE President's Council of Economic Advisors has just issued its first report—a masterpiece of "on the other hand" economic reporting which says "all groups must indicate a willingness to face the issues and demands of a free enterprise system realistically and show intelligence or flexible experimentation in arriving at workable formulas of adjustment."

The raucous noises of the statistical argument now going on over the CIO-Nathan report which contends that industry can stand a 25 per cent bite without feeling any pain, plus the noises of publicity hungry members of Congress predicting what they propose to do to labor has served to hide the fact that big business and big labor want to settle their differences across some table.

CIO's United Steel Workers (Murray) have set no definite figure on their wage demand; CIO's United Automobile Workers (Reuther) have set a definite 23½ cents per hour increase. Business, on the other hand, has not finally closed its doors to negotiation and many large firms with good profit showings probably can — and may — pay a substantial increase because they appreciate that costs of living have increased.

What finally happens probably will depend on the results of steel's negotiation in January and auto's negotiations shortly after.

★ STAR PERFORMER
IN
PRODUCTION EFFICIENCY
OPERATOR SAFETY
EASE OF OPERATION

BEDINGER 27-INCH METAL SPINNING LATHE

SPECIFICATIONS:

27" Swing, 6' Straight Bed
Distance between Centers, 32½"
Size of Spindle, Front Bearing 2" I.D., 3.671" O.D.
Size of Spindle, Rear Bearing, 1.437" I.D., 3.548" O.D.
Taper in Tail Stock, No. 3 Morse
Size of Tail Stock Shaft, 2" Dia.
Spindle Thread, 2¼" Dia., 6-Pitch Thread
2-Speed 5 HP motor with 4 speed LIMA drive giving eight spindle speeds.
High—1730, 930, 555, 420 RPM
Low—850, 460, 270, 205 RPM
Weight with Motor, 2,000 lbs., approx.
Combination screw and cam tail stock with 2" screw travel after cam is locked.

OUTSTANDING FEATURES

★ Heavy Duty Taper Roller Bearings running in oil in the Headstock.

★ Positive Lock Adjustable Tool Rest which cannot drop or slip in any direction. (Pat. applied For.)

★ Positive Lock Rotary Cam Tailstock. (Pat. applied For.)

Designed by metal spinners with a view toward safety, efficiency and ease of operation.

The headstock spindle is equipped with extra heavy duty tapered roller bearings and delivers eight speeds ranging from 205 to 1730 RPM, through the use of a 4-speed LIMA Drive, powered by a 2-speed 5 HP motor. This permits changing from high to low or from low to high speed by merely pushing a button, and without stopping spindle.

Also available: Bedinger 27 in. Lathe Converted to 27x60 in. Gap Bed Lathe

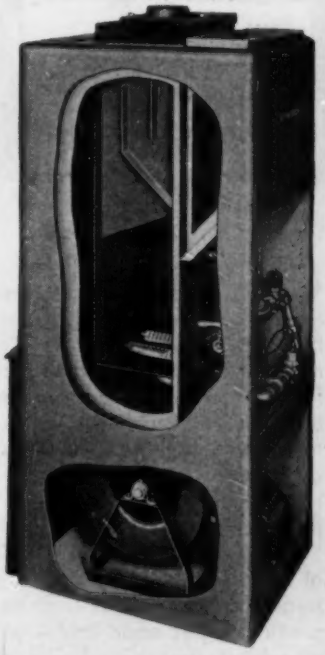
Prompt deliveries now. Write Dept. A

ERMAC COMPANY
1426 SOUTH SANTA FE AVENUE
LOS ANGELES 21, CALIFORNIA

IN 1947 TURN TO SYNCROMATIC FOR GAS-FIRED STEEL WARM AIR FURNACES

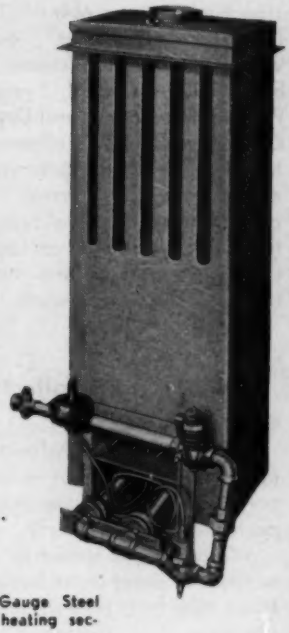
Leaders of the Field

Syncromatic Gas-Fired Basement Models, 4 Sizes—
120,000 to 240,000 B.T.U.



Syncromatic Gas-Fired Utility Room Models, cutaway view.

Syncromatic Gas-Fired Utility Room Models, 2 Sizes—
75,000 to 100,000 B.T.U.



Heavy 10-Gauge Steel Gas Unit heating section.

FOR... NATURAL MANUFACTURED MIXED AND BUTANE GAS

Syncromatic Corporation
WATERTOWN, WISCONSIN

The Editor's NOTE BOOK

Our Industrial Book

COMES a letter from James Marshall, way down in Hawthorn, Victoria, Australia—"I note in your Editor's Notebook for September reference to a book 'Correct Practice in Industrial Work'—please send me a copy. And I also endorse the requests of others for more pattern articles by Mr. Neubecker."

For those who haven't heard of this book we'll say it's a 196-page compilation of articles previously published in AA on all subjects pertaining to industrial sheet metal work. There are nine sections as follows—Design and Engineering Data; Fume Removal Systems; Grain Handling Systems; Metallic Dust Collecting Systems; Wood Waste Removal Systems; Fibrous Lint Removal Systems; Paint Spray Booths and Drying Ovens; Patterns; Miscellaneous. In all, more than 75 separate articles and they cover just about every possible type of industrial problem or application. And they are mostly actual jobs—which work.

The price is $2.00.

◆

Portable Dust Collector

Gentlemen:

Can you recommend and furnish addresses of reputable companies who manufacture portable dust collectors?

We are in the industrial and residential sheet metal business. Have calls from time to time on portable dust collectors. The *systems we install are stationary.*

Gentlemen:

Detroit, Mich.

We judge from your letter that by "portable dust collector" you mean a self-contained unit with filters, sprays, fan, etc., which may be located adjacent to the grinders or machine creating the dust.

We know of no apparatus which is truly portable in the sense of being a vacuum cleaner which is wheeled up and connected to the machine.

If the type of equipment you require is described in our first paragraph, then there are numerous manufacturers of this equipment which you will find listed in the classification "Collectors, Blowpipe" in AA's Directory.

We would like to point out that most of these manufacturers are also installation contractors. Some of these manufacturers will sell equipment to installing contractors, but you will have to determine the circumstances by writing the companies.

American Artisan

◆

Poor Kids

A "FAD for promotions" and "passing grades" regardless of pupil achievement is preventing schools from fulfilling their obligations to students, Dr. George E. Carrothers, director of the University of Michigan Bureau of Cooperation with Educational Institutions, believes.

"There is a strange notion current among both school personnel and parents that no pupil ever fails, or that if he does fail he should not be permitted to learn that fact for fear the knowledge might injure his personality," Dr. Carrothers charged.

The situation reflects the idea either that all pupils are born with sufficient intellectual ability to do acceptable school work without any failures, or that the work offered ought to be watered down to a level which makes it possible for each child to be promoted each year, he explained.

The "promotion fad" results from the desire of school personnel to make a good showing and from parent pressure upon school board officials and teachers to promote their children whether or not they deserve it, Dr. Carrothers said.

ROYAL
Introduces
A NEW
FLOOR FURNACE

The new, shallow, pitless type, AGA approved ROYAL Floor Furnace—with all the easy-to-install features of the Duals . . . Now ready for prompt delivery.

For Greater Profits—*The ROYAL Way.* Write for information and prices *today.*

ROYAL
HEATERS, INC.

1024 Westminster Ave., Alhambra, California (Dept. A-1)

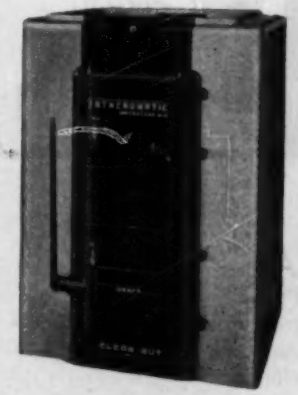
IN 1947

TURN TO SYNCROMATIC

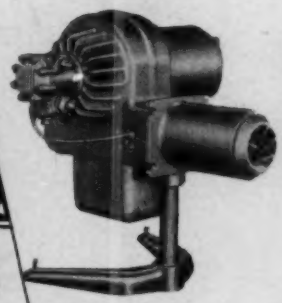
FOR MODERN OIL AND COAL WARM-AIR STEEL FURNACES

Leaders of the Field

Syncromatic CFB-0 Oil - Fired Series, 5 Sizes— 90,000 to 250,000 B.T.U.



Syncromatic Coal-Fired Gravity Furnace, 5 Sizes— 70,000 to 183,000 B.T.U



Model S1 Oil Burner

Syncromatic Coal-Fired Forced Air Furnace, 5 Sizes—90,000 to 250,000 B.T.U.

Syncromatic Oil-Fired Forced Air Furnace showing installation of S1 Oil Burner.

EFFICIENCY
ECONOMY
SAFETY
BEAUTY

Syncromatic Corporation

WATERTOWN, WISCONSIN

The Editor's NOTE BOOK

Damn Dumbness

AT a recent meeting of the Publicity & Merchandising Committee of the N.W.A.H. & A.C. Ass'n, Hugh Thompson, of Cincinnati (chairman of the association's Dealer Committee) reported that "everybody is selling gas heating equipment in Cincinnati—department stores, auto dealers, perhaps drug stores—and the gas heating load is getting terrific."

But of more interest Hugh reported that the salesmen of these opportunists are making statements which are just plain damn foolish. For instance, one customer who was told by a salesman—"Don't worry about any gas shortage—you need a burner which will give you 100,000 Btu—we'll put in a burner with 200,000 Btu capacity—so even if gas gets short you'll have plenty in reserve."

Says Hugh—"That's a fair sample of how little these new firms and salesmen know about heating — the situation is packed with great danger for our whole industry — somebody's going to get an awful black eye."

◆

Engineers in Politics

Said Congressman Carl Hinshaw of California (himself an engineer) "there are only four engineers in the Congress—Senator Flanders of Vermont; Senator Malone of Nevada; Congressman MacDonough of California; and myself. Two out of 435 members of the House and two out of 96 members in the Senate. We are very much alone.

"Best of all professions, the engineer knows that strikes and slow-downs lead to destruction of the national economy. There should be engineers in city councils; in state legislatures, in the Congress. Strong forces are pulling America to the left. This is a time for clear thinking and correct appraisal. This is the time for the engineer to take the lead—he must find words to express the great basic truths of employment, production, costs, prices. For example:

"Automobile production is down 10 per cent from the prewar average while the number of manhours has increased 78 per cent. This means we have 90 per cent production from 178 hours of labor. With wages up nearly 100 per cent, the cost of labor in dollars per car is four times prewar. So, while the mechanic gets twice as many dollars in pay he can buy only half as much as he did prewar.

"Production is what really counts. A man, his family, his country gets rich by working—not by loafing and slow-down. The American standard of living is no miracle—it is the product of brains and hard work. The engineer knows this—now is the time for him to speak out so all may hear and know."

◆

Mighty Poor Planning

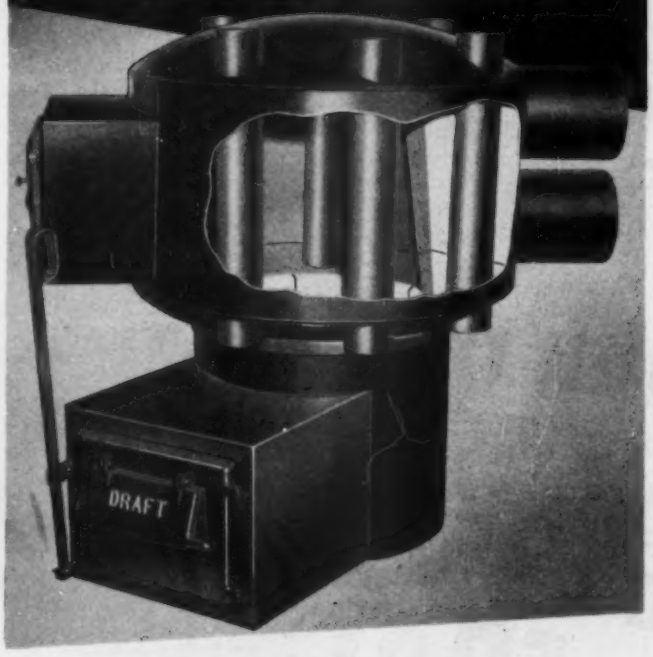
Lack of cooperation among executive branches of the Federal government is cited as a major factor in the collapse of the veterans emergency housing program.

This accusation is supported by the recent announcement that the War Assets Administration and the National Housing Authority are releasing 12 million pounds of nails from army and navy stockpiles.

According to the two government agencies, this is enough for construction of 30,000 houses—provided other scarce materials are available.

What some people are wondering is why it took the WAA and the NHA months to discover and release this stockpile of nails . . . and what other critical materials vital to building still are buried in government warehouses, galvanized iron sheets, for example.

Let's talk Tuberator



THREE POINTS FOR PROFIT with TUBERATOR in 1947!

Yes sir, here are three mighty important selling features that will make the TUBERATOR warm-air furnace a real sales-leader for *you* in 1947.

(1) **100% PRIMARY HEATING SURFACE eliminates need of secondary radiators and provides maximum heating efficiency.**

(2) **RADIANT HEATED AIR CONDUCTOR TUBES provide faster gravity air circulation . . . make the heating of *distant* rooms easy.**

(3) **REVOLVING ASH PIT makes TUBERATOR quickly convertible to GAS, OIL, COAL, or STOKER installation without expensive structural changes.**

TUBERATOR dealers everywhere are finding that one TUBERATOR installation leads to *many* more . . . because people are fast discovering the advantages of this unusually safe, amazingly economical, and highly efficient, radiant warm-air furnace! Get your share of profits with TUBERATOR now! More TUBERATORS are rolling off the production line every day . . . more than ever will be ready for you in 1947!

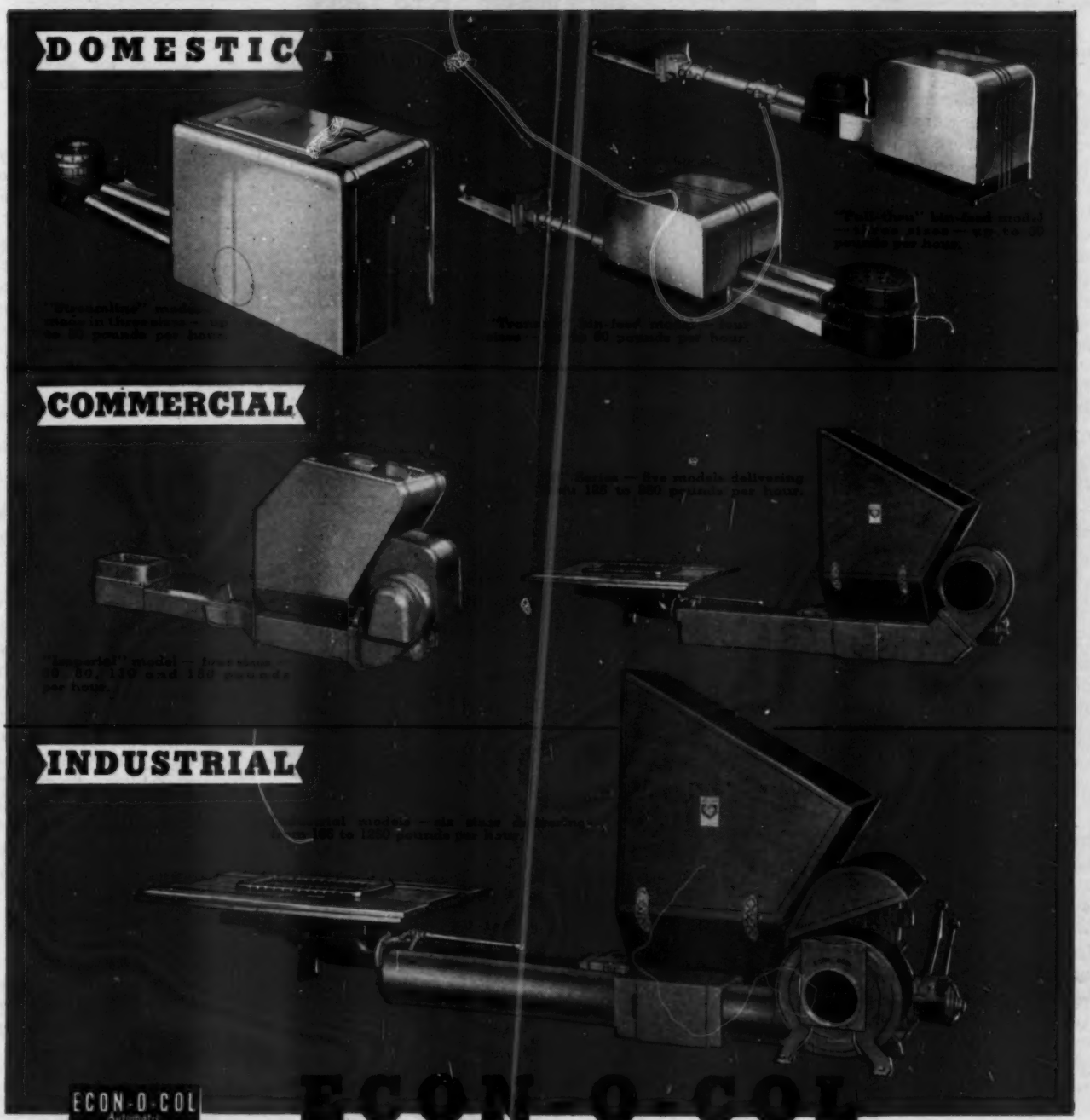
See our exhibit at the International Heating & Ventilating Exposition at Cleveland in January or write direct to Dept. A-147 for details.

WHEELING FURNACE CORP.
MARTINS FERRY, OHIO

The Editor's NOTE BOOK

LINE UP WITH ECON-O-COL

Time-tested for Performance • *Sales-tested* for Profits!



ECON-O-COL

ECON-O-COL Automatic COAL BURNER

THE SHIELD OF QUALITY

The "Stronghearted" Stoker

MANUFACTURED BY COTTA TRANSMISSION CORPORATION ★ ROCKFORD, ILLINOIS

The Editor's NOTE BOOK

Plumbers Want Burners

FROM Jay Biddle of Detroit association comes word that in Detroit the plumbers are seeking jurisdiction to install all gas and oil burners on the basis that piping is used. The warm air associations are fighting the move and probably will win because the city code is pretty specific in assigning oil and gas burners to warm air heating contractors.

◆

Tomorrow's Factories

Tomorrow's factories will have eye-appeal inside and out and will be pleasant places to work, according to a survey among industrial architects, who list these developments:

1. Simple, horizontal designs, and buildings of one-story.
2. Year-round air conditioning, scientific lighting, restful interior schemes and insulation against noise—all designed to remove nervous strain and make working conditions pleasanter.

◆

Portal to Portal

THE judge who rendered the economy shaking decision in the Mt. Clemens pottery case must, indeed, be viewing with astonishment the swift repercussions which currently are using up newsprint like a wartime major campaign.

Latest in the expressions of opinion which are adding fuel to the fire is the report of the Bureau of National Affairs which suggests that "time spent in more than two dozen activities often unrecognized as actual working assignments may be used in seeking millions of dollars in back wage claims—such as: riding from home to a plant; walking from plant gate to job stations; running errands; making supervisory and survey trips; changing clothes; washing up; collecting tools; adjusting machinery; throwing switches; opening windows; standing in line; waiting for assignments; lunching on duty; taking training courses; etc."

CIO seems to be taking this situation seriously, AFL says it proposes to go easy and keep negotiations on a "bargaining" basis. Aimed primarily at the mass production industries, it can be that a few cases decided in favor of labor will open all the flood gates and lead to complete chaos.

◆

Our Labor Force

CURRENTLY industrial employment has reached new peaks and unemployment has reached a late-years high of just under 2 millions (unemployment was 12 millions in 1933). Extra workers came off the farms after the last harvest; women have come back from their homes; of 13 million veterans over 1 million are in school, one half million are disabled, about 750 thousands are out of a job and about 11 millions are working. Veterans still present a problem—their average "quit" rate is 50 per cent higher than non-veterans and in heavy industry their "quit" rate is averaging 100 per cent a year.

Labor is still "moving" from here to there. During the war the far west showed the greatest change, a plus 33 per cent in workers; in the past year the national change has been above 7 per cent—north going south; south coming north; east going west, etc.

Estimates are being made that by or about 1950 there will be a 12 per cent addition to the nation's total labor force—about 8 per cent increase in the north; about 16 per cent in the south; an additional 33 per cent to the west. Whether for climate or just greener pastures isn't forecast.

All this adds up to a problem for the employer in keeping labor working and satisfied.

*AT-A-GLANCE OIL GAUGE

EASY TO READ from ANY DIRECTION

Check the exclusive features of "AT-A-Glance" oil gauge and you will see why it is preferred by dealers and consumers alike. Its perfect visibility that permits easy reading from all directions, "At-A-Glance" is just one of its exclusive patented features. Here is a gauge that is a combination that produces a clear reading, leakproof top, completely protected against destruction or deterioration by shock, heat, flame, or fumes. It is designed and made with a double enclosure of plastic. The calibration assembly prevents oil from seeping into the calibration dome.

No magnets or springs are used, guaranteeing dependability at all times.

No gears, cams or intricate mechanism to cause trouble or wear out.

Its construction is as simple as possible for accuracy. "At-A-Glance" gauge is a simple lever action that moves the indicator disc up or down as the contents in the tank are raised or lowered. Easy to install in all basement tanks, even when partially full. No adjustments are necessary. "At-A-Glance" gauges are constructed at the factory to fit all tank sizes according to individual specifications.

* Trade Mark Registered.

You're not only safe with "At-A-Glance" gauge, but once installed there is nothing to require attention from you or your customer. "At-A-Glance" gauges are distributed by leading jobbers in the United States, Canada and Mexico.

AT-A-GLANCE GAUGES are listed as standard by UNDERWRITERS LABORATORIES

Write FOR COMPLETE DETAILS . . .

KRUEGER SENTRY GAUGE CO.

GREEN BAY, WISCONSIN

The Editor's NOTE BOOK

Heating contractors . . .

here's why RHEEM stokers

are your

easiest selling line

Your selling job's half done for you when you handle the new Rheem line of automatic stokers and stoker furnaces. Because Rheem national advertising is *pre*-selling more than eleven million prospects for you. In 1947, these five leading magazines are carrying the Rheem home-heating story in full-page color ads like this . . . telling *your* prospects why Rheem is the best buy in home heating equipment.

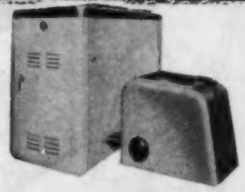
For you who handle the new Rheem stoker and stoker furnace, it means *pre*-sold prospects, easier sales, bigger profits. And best of all, these beautiful new automatic coal-heat products are available *now* . . . so call your local plumbing and heating jobber today. And for full details on the Rheem stoker and stoker furnace, write

RHEEM, 570 LEXINGTON AVENUE, NEW YORK 22, N. Y.

RHEEM

How a house becomes a Home ...by RHEEM
WARMTH where the children sleep and play
WARMTH to make winter seem the blue
WARMTH through the coldest night or day
WARMTH the even, easy automatic way
RHEEM
...making houses into homes

New Rheem automatic stoker. Silent, dependable. Sealed Power Drive guaranteed 3 years. Sizes: 20 and 35 lbs. coal per hour.



New Rheem automatic Stoker furnace. Heats, filters, humidifies, and blower circulates warm air. Sealed Power Drive in stoker guaranteed 3 years. Size: 12" fan.

When Johnny Comes Marching Home Again—
You Can Have All the HANDY PIPE You Want!
When the above headline and this border design appeared in this publication THREE YEARS AGO, we honestly believed what the headline said!
Had anyone told us then that, in January 1947, with the war "over" in September 1945 and with the millions of "Johnnies" home again and with "Peace"—of a sort!—over a year old, we would be struggling as we are today to get sufficient materials . . . sufficient workmen and sufficient shipping facilities to fill orders for
HANDY PIPE
that have been "on file—to be filled as soon as conditions permit", we would have considered that person a poor prophet.
BUT HOW RIGHT HE WOULD HAVE BEEN!
Today we ARE struggling to fill long-ago-filed orders and those that are still "marching home" to us. We are doing our BEST to meet your requirements for the BEST furnace pipe the market affords.
The time is not yet when "You Can Have All The Handy Pipe You Want" . . . but our production is UP—just as far UP as we can push it! . . . and we promise you that, in 1947, we will fill every possible order that increased facilities and materials permit!
HANDY
MEYER
F. MEYER & BRO. CO.
PEORIA, ILLINOIS.

Associate with Success!

NIAGARA

. . . backed by more than 55 years' experience in building residential heating equipment . . .

NIAGARA
Model 10-75VAC

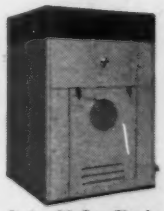
. . . and *Now*
A New, Compact Gas-Fired Winter Air Conditioner
for Utility Room and Apartment Installations

● With over-all width of 28¾" and depth of 32½", this compact Model 10-75VAC employs the standard Niagara system of heat extraction, noted for low-cost operation. Combustion chamber, side radiator and flue pipe are made of heavy-gauge Toncan iron. Blower, filter and enclosed controls are easy of access through removable front panels. AGA rating, 75,000 Btu. input. Shipped as package unit.

Now, more than ever, Niagara is a line that builds profits and prestige for heating dealers. Associate with Success—with Niagara!

THE FOREST CITY FOUNDRIES COMPANY
2500 WEST 27th STREET • CLEVELAND 13, OHIO

Series 20 Gas-Fired Winter Air Conditioning Unit—CAST IRON



Series 20 Gas-Fired Gravity Furnace—CAST IRON

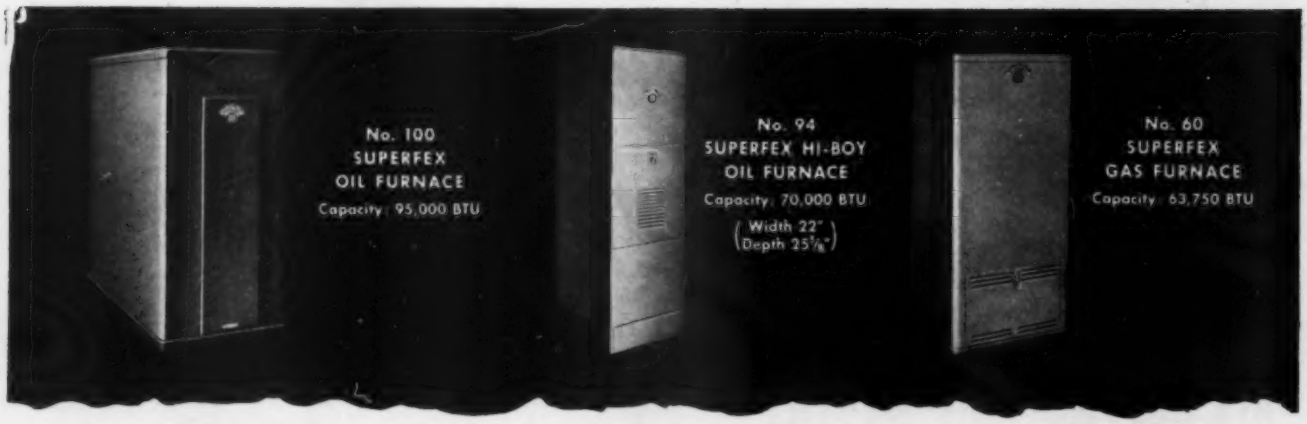
Series 10 Gas-Fired Gravity Furnace—STEEL

Coal-Fired Square Furnace—CAST IRON or STEEL

Coal-Fired Round Furnace—CAST IRON or STEEL

NIAGARA

GRAVITY AND WINTER AIR CONDITIONING UNITS



"HOMOGEN-AIR" floor-to-

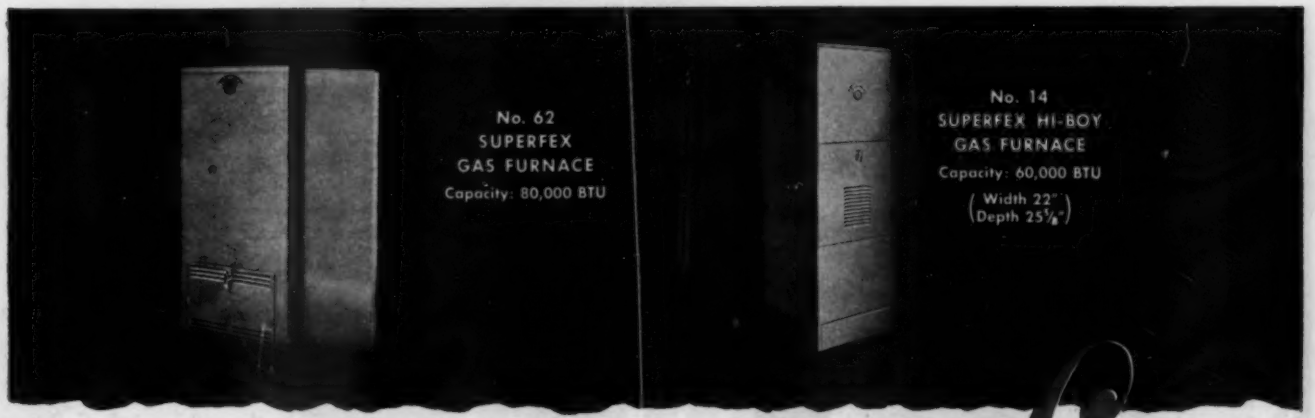
"STOP-AND-GO" HEATING

Ordinary furnaces deliver blasts of heat that quickly rise to the top of the room like the cream on a bottle of ordinary milk. Most home-owners know the results of "skimmed milk" heating—chilly ankles, drafty floors, constant discomfort.

Here's the new Superfex Homogen-Air clock available to Superfex Dealers — a compelling sales promotion unit, pre-tested for effectiveness.

HOMOGEN-AIR HEATING

Here's heating satisfaction you've never dared to promise before. Three stage fire control and constant circulation, built right in to the furnace itself, with no extra controls needed! Superfex delivers a steady flow of healthful, comfortable, balanced warmth all around the clock . . . at living level . . . at low fuel cost.



ceiling comfort

WITHOUT EXPENSIVE EXTRA CONTROLS

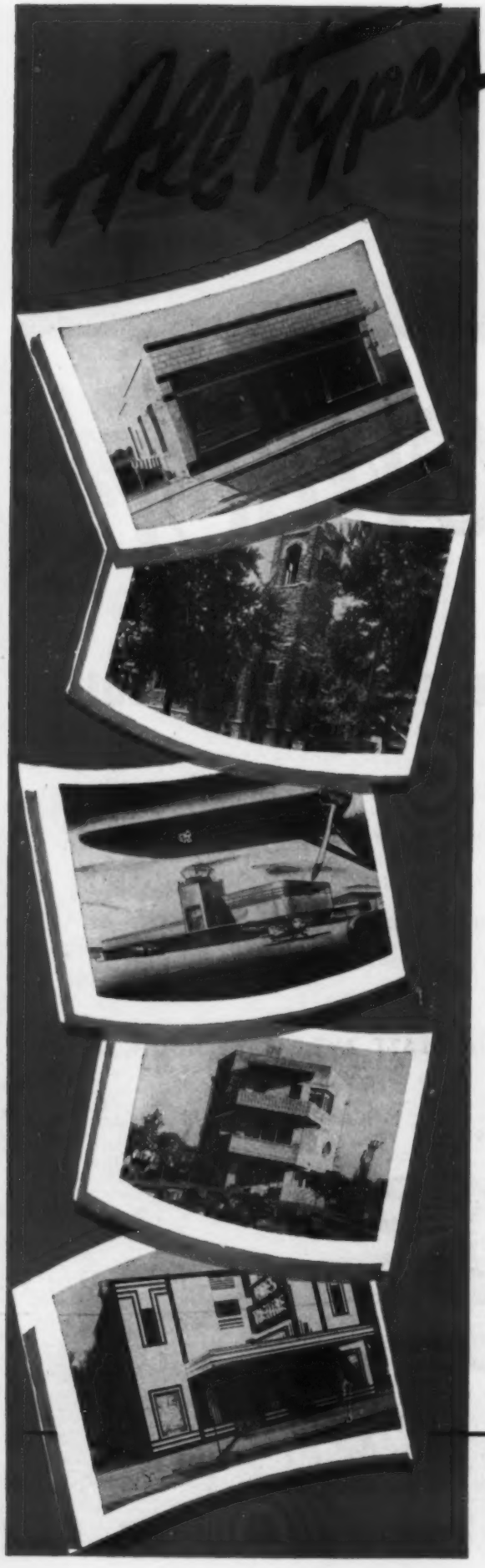
IMAGINE a heating system that delivers constant, gently moving warmth at all room levels . . . with temperature variations as little as 4° between floor and ceiling . . . Think what it means to be able to offer such positive comfort without expensive extra controls! That is why Superfex is the talk of the trade.

THE PERFECTION STOVE COMPANY • 7864-A PLATT AVE., CLEVELAND 4, O.

Superfex

"HOMOGEN-AIR"

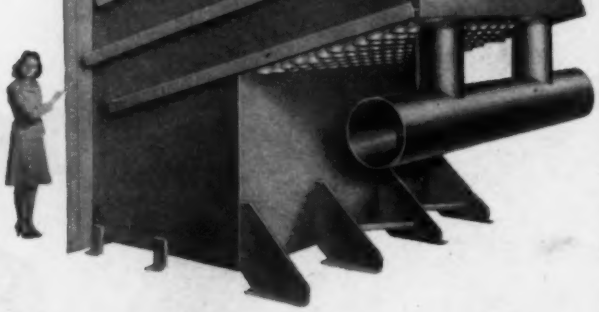
WINTER AIR CONDITIONING FURNACES



OF BUILDINGS EFFICIENTLY HEATED BY J & C POWER HEATERS

What's the heating problem? A garage? Factory? Office building? Store? School? Airport hangar or administration headquarters? Church? No matter what it is, any building can be heated economically and efficiently with a J & C Power Heater. These modern heaters, built along thoroughly new and proven principles which include the increased direct radiation surface for capturing more usable heat from a relative minimum of fuel, are built to produce 160,000 to 3,000,000 B.t.u.—a range that puts J & C right in front when it comes to meeting varied heating demands. J & C Power Heaters are trim and compact—they conserve floor space while harmonizing with finished interiors of basement, storerooms, and display rooms. And they are made in one-piece, electrically-welded units—gas-tight and leak-proof so that all heat is retained for distribution by ample blower system. J & C Heaters are available in gas, oil, and coal fired models and may be adapted to mechanical firing. For maximum heating economies and benefits, get the heater that offers the maximum advantages—J & C Power Heaters, manufactured by Jackson & Church Co., Saginaw, Michigan. Write for complete information.

VISIT US AT THE 7TH INTERNAT'L HEATING AND VENTILATING EXPOSITION • LAKESIDE HALL, CLEVELAND • JAN. 27-31 • SPACE 871-877.



Model 60 with casing removed

MEMBER INDOOR COMFORT

JACKSON & CHURCH CO.,
SAGINAW, MICHIGAN • WORK WELL DONE SINCE '81

Randall PILLOW BLOCKS

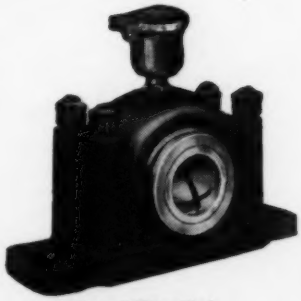
Quiet and Efficient

. . . for ALL TYPES of Air Handling Equipment

One-Piece Steel Housing Pillow Block—
Either Single or Double Oil Reservoir

Streamlined One-Piece Steel Housing Pillow
Block—Either Single or Double Oil Reservoir

Standard Pillow Block—
Single Oil Reservoir



Universal Pillow Block—
Double Oil Reservoir

Randall's complete line includes precision-manufactured pillow blocks for every type of air handling equipment. Their long, quiet, trouble-free service is the result of more than 41 years of Randall bearing engineering and manufacturing experience. Since pillow blocks were added to the Randall line, almost four million have been manufactured and sold for air handling and other types of equipment.

Design features that make Randall Pillow Blocks so popular include:

- Constant Self-Alignment
- Self-Lubrication
- Strong, Sturdy Housings
- Low in cost
- Accurately Finished Bearing Surfaces
- Easy Installation
- Long-Life Dependability

Catalog No. 47 gives complete information on the Randall line. Send for your copy today. There is no obligation.

Representatives Carrying Stocks

C. W. Marwedel
San Francisco, California

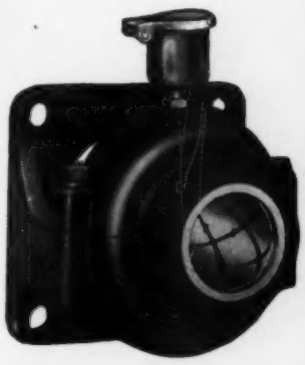
Tek Bearing Company
177 Lafayette Ave., New York 13
510 Cambridge St., Boston 34

Salt Lake Hardware Co.
Salt Lake City, Utah

Edward D. Maltby Co.
1718 Flower Street
Los Angeles 15, California

Cut-away half-section of ball,
showing large upper and lower
wool-packed oil reservoir

Cut-away half-section of ball, showing
large single oil reservoir



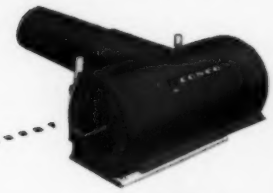
Flange or Side-Mount Pillow Block—
Double Oil Reservoir

RANDALL GRAPHITE PRODUCTS CORPORATIO

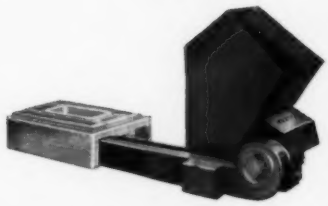
609 WEST LAKE STREET, DEPARTMENT 111, CHICAGO 6, ILLIN

A FULL LINE FOR FULL PROFITS

CONCO heat



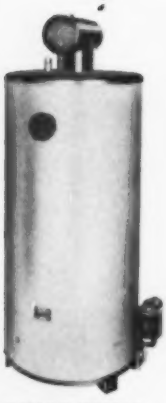
CONCO CONVERSION OIL BURNERS
Two models for domestic and small commercial applications. Model T-1A for capacities up to 2 gals. per hour. Model T-2A up to 5 gals. per hour. Employ the exclusive Magic Flame principle.



CONCO HEAVY DUTY STOKERS
Six models ranging up to 150 H.P. Well engineered for continuous heavy duty operation at a minimum of maintenance. Burn a wide variety of coals efficiently.

CONCO STEEL FURNACES
Full line of gravity and forced air furnaces for coal, stoker or oil firing. Heat exchangers are of extra heavy steel both welded and riveted. Round and square casings.

CONCO DOMESTIC STOKERS
Binfeed and Hopper models — three sizes: 15, 30 and 50 pounds per hour. Inter-Planetary Transmission. Airmeter, Coal Feed Selector, no shear pin.



CONCO WATER HEATERS
Oil fired with automatic temperature control. Two sizes — 25 and 45 gallon capacity. High recovery rate. Made of copper bearing steel, attractively finished in silver-gray baked enamel.

CONCO GAS-FIRED WINTER AIRCONDITIONERS
Four sizes from 90,000 to 212,000 BTU input. All welded heavy gauge steel construction. Long fire travel — large heating surface. Also two sizes of gravity furnaces.

CONCO OIL-FIRED WINTER AIRCONDITIONERS
Three models from 75,000 to 185,000 BTU capacity. Completely packaged — assembled and wired. Very compact and smartly styled. High overall plant efficiency — surprisingly low operating cost.

CONCO ENGINEERING WORKS
MENDOTA, ILLINOIS

FINER TEMPERATURE CONTROLS...at competitive prices

TYPE-A CAM-STAT—Approved by U.L. for general application at 120-240 volts A.C. Patented actuator provides positive snap action. Features: High current carrying capacity (without condensers), low differentials, wide selection of temperature ranges, resistance to vibration, SPST, SPDT, double-break contacts without pigtails, range adjusting lever, low cost and compact design.

ROOM THERMOSTAT—Ideally suited for home heating and ventilating and, because of its stability against vibration, for trains, busses, airplanes and ships. Graceful design...easy to install...no current carrying parts exposed even with screen removed.

AIR LIMIT CONTROL—For warm air heating systems. This easy-to-install unit is a line voltage control with conduit outlet.

WATER LIMIT CONTROL—For hot water heating systems. A line voltage control with conduit outlet, it is clamped either vertically or horizontally to water riser.

FAN CONTROL—For control of blower on warm air furnace. It is a line voltage control with conduit outlet. For high and low blower rise controls may be mounted side by side. SPDT arrangement can be supplied.

For complete details, write to Dept. AA-1.

CAM-STAT Incorporated
Division of The Paul Henry Company
2037 SOUTH LA CIENEGA • LOS ANGELES 34, CALIFORNIA

For 3 generations a step ahead

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

WEIR-MEYER heating equipment for every installation

For any fuel, there's truly modern WEIR-MEYER equipment to lead the field! For every home heating requirement, the WEIR-MEYER dealer has a custom-fitted heating plant to insure fine performance combined with economy, ease of installation, and freedom from servicing. Heavy-duty systems also available for public buildings, commercial and industrial installations. WEIR-MEYER equipment is backed by aggressive, well-rounded merchandising and advertising—millions have read the WEIR-MEYER messages in national Home Magazines. Franchise plan, too, protects dealer's investment of time and money. Write today for full details.

COAL

WEIR *UC Series*
Air Conditioner

WEIR *U Series*
Gravity Steel Furnace

WEIR Furnaces—the *original* steel furnaces for solid fuel, enjoy a position of leadership as distinctly as ever. Combined with famous WEIR riveted-and-welded construction, the newly developed integral front* offered in the U Series gives even finer performance and durability combined with simplified installation.

Patent applied for

WEIR *Stoker*

WEIR-MEYER means *Modern Heat* for postwar America

WEIR·MEYER

MEYER *"Hi-boy"*
Gas-fired Air Conditioner

MEYER *Gas-fired*
Air Conditioner

MEYER *Gas-fired*
Gravity Furnace

MEYER gas-fired units give home owners the ultimate in convenience, efficiency, and economy of operation. Leakproof heating element of one-piece welded steel; quick heat transfer. Acclaimed by dealers and public utilities, too.

MEYER *Oil-fired*
Air Conditioner

MEYER *"Hi-boy" Oil-fired*
Air Conditioner

MEYER oil-fired units are engineered for maximum efficiency and long life with freedom from servicing. All-steel heating element of exclusive design with stainless steel combustion chamber simplifies installation, too.

THE MEYER FURNACE COMPANY · PEORIA, ILLINOIS

The MEYER FURNACE
PEORIA 2, ILLINOIS · *Company*

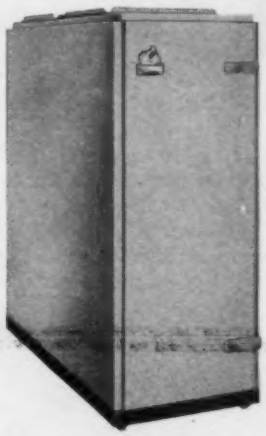
MANUFACTURERS OF WEIR·MEYER FURNACES

Air Conditioners for
GAS · OIL · COAL

General Offices: Peoria 2, Illinois
Factories: Peoria and Peru, Illinois

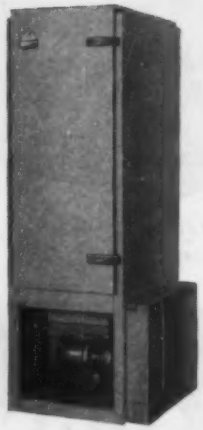
SELL *the*

You get MORE for NO MORE with LUXAIRE!

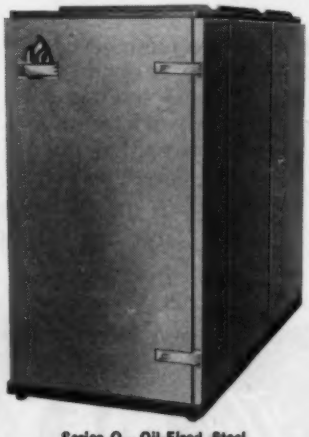


Series A—Gas-Fired, Steel Air Conditioning Unit

Series G—Gas-Fired, Steel Gravity Furnace

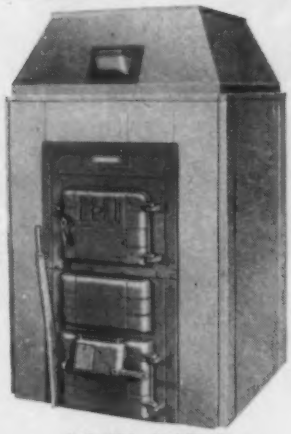


Series H—Gas-Fired, Utility Steel Air-Conditioning Unit



Series O—Oil-Fired, Steel Air Conditioning Unit

Series AC-700—Coal-Fired, Steel Air Conditioning Unit



Series 700—Coal-Fired, Steel Gravity Furnace

Series C—Coal-Fired, Cast Gravity Furnace

"Luxury Line" OF AUTOMATIC HEATING & AIR CONDITIONING EQUIPMENT...

Luxaire

● Every unit in Luxaire's "Luxury Line" is outstanding for its many comfort, convenience, and economy features. Buyers of heating equipment are immediately attracted by the advanced design, compact construction, and efficient operation of every Luxaire model. Regardless of the fuel preference—gas, oil, or coal—there is a Luxaire unit that satisfies your customers' needs.

Nation-wide acceptance is making Luxaire the "most-in-demand" heating equipment. That's why it will pay you well to sell the "Luxury Line."

IMPORTANT: Luxaire gas-fired units have passed the latest requirement of the American Gas Association.

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS

ELYRIA, OHIO

Sampsel Controls are engineered for finer performance — built for long life — tested and proved before leaving the factory to assure dependable service!

Sampsel
AUTOMATIC CONTROLS

SAMPSEL STANDARD THERMOSTATS

Attractive in appearance, rugged, accurate, with temperature range from 50° to 90°; coin silver contact points; snap-action make and break; easily adjusted differential.

STANDARD THERMOSTAT without wall base Model Nos. S-20, S-22

S-21 Two wire, low voltage for all 2-wire jobs. With wall base. Height 5": width 2½": depth 2¼". Electric rating 1¼ amps. on 24 volts or less.

S-20 Two wire, low voltage. Same as S-21, wall base omitted.

S-23 Three wire, low voltage for all 3-wire, 2-circuit jobs. With wall base. Height 5": width 2½": depth 2¼". Electric rating 1½ amps. on 24 volts or less.

S-22 Three wire, low voltage. Same as S-23, wall base omitted.

S-25 Two wire, line voltage, heavy duty. 2000 watts, 110 volts non-inductive load maximum.

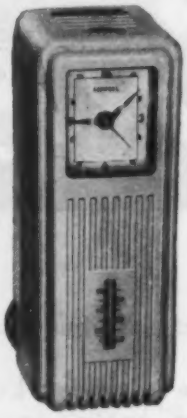
S-26 Two wire line voltage control for motors, unit heaters, evaporator coolers, electric heaters, and other applications where load is not in excess of 12 amperes. 1300 watts at 100% power factor. Electric rating 115 or 230 volts A. C. Motor rating ½ H. P.—R. I. or Cap—⅓ H. P.—S. P.

S-21X COOLING THERMOSTAT Two wire, low voltage. Closes circuit on temperature rise, breaks on temperature drop. Range and ratings same as S-21 STANDARD.

S-26X COOLING THERMOSTAT Two wire line voltage for control of line voltage where load ratings are similar to S-26 STANDARD.

STANDARD THERMOSTAT with wall base Model Nos. S-21, S-21X, S-23, S-26, S-26X.

Sampsel Day-Night Clock Thermostats are offered in an amazingly moderate price range!



DAY-NIGHT CLOCK THERMOSTAT PACKAGE Units 8072, 8071 Models DN-71, DN-25, DN-14

SAMPSEL DAY-NIGHT CLOCK THERMOSTATS

Package Unit 8072 consists of DN-25 two wire, low voltage Clock Thermostat with 115-24V transformer and 33 ft. 4 wire color code conductor. For jobs where 2-wire circuit is used. Range 55° to 90°. Height 8¾": width 3¼": depth 3¼". Electric rating 1½ amps. on 24 volts or less.

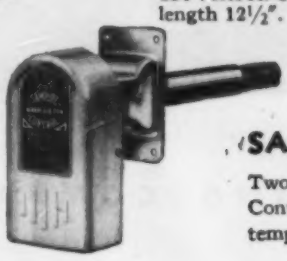
Package Unit 8071 consists of DN-71 three wire, low voltage Clock Thermostat with 115-24V transformer and 33 ft. 5 wire color code conductor. For jobs using 3-wire circuit. Range, dimensions, electric ratings same as DN-25.

DN-14 Three wire, low voltage Unit with 33 ft. 5 wire color code conductors. For use only with B-14 A1 Series Fire Pilot Controls. Range, dimensions, electric ratings same as DN-71. ***The DN-25, DN-71, DN-14 can be purchased as separate units!***

Type S-48 3-IN-1 WARM AIR FURNACE CONTROL

SAMPSEL 3-IN-1 WARM AIR FURNACE CONTROLS

Offers in one unit the following features: (1) 3-wire low voltage limit control. (2) 2-wire line voltage limit control. (3) 2-wire line voltage fan control. Patented switch assures positive snap-action make and break. Mounted in dust-proof case. Adjustable operating range, 50° to 450°—adjustable differential range of 10° to 90°. Adjustable mounting flange. Electrical capacity 25-115-230 volts A. C. Rating ½ H. P. Height 5½": width 3¼": length 12½".



Type S-49 FAN or BLOWER CONTROL

SAMPSEL FAN CONTROLS

Two wire line voltage for Fan or Blower Control only. Calibrated in proper temperature range for this purpose.

SAMPSEL DAMPER CONTROLS

Takes work out of hand-fired furnaces and boilers. Opens and closes dampers by thermostatic control. Operated by Standard S-22 or DN-71 Clock Thermostat. Built-in heavy duty transformer.

Type 88/12 DAMPER CONTROL only

SAMPSEL TIME CONTROL, INC., Spring Valley, Illinois

SAMPSEL DAMPER CONTROLS PACKAGE UNITS

PACKAGE UNIT NO. 8874 Includes Sampsel Day-Night Clock Thermostat for maintaining different temperature levels during day and night; Sampsel Damper Control; and Sampsel Warm Air Limit Control, plus necessary accessories. Unit No. 8874 is the preferred unit for maximum convenience and fuel economy!

PACKAGE UNIT NO. 8871 Same as Above Without Limit Control.

PACKAGE UNIT NO. 8873 Includes Sampsel three wire, low voltage Thermostat; Sampsel Damper Control with built-in transformer; and Sampsel Warm Air Limit Control, plus all necessary installation accessories. Unit No. 8873 is a complete unit for the average home where it saves work and fuel!

PACKAGE UNIT NO. 8870 Same as Above Without Limit Control.

SAMPSEL STOKER CONTROLS

Furnished in 115 volt or 230 volt A.C., 60 cycle; also 115 volt A.C., 25 cycle. Height 9": width 7½": depth 5". Complete line of industrial and domestic stoker control units for gravity or forced air systems, as well as steam or hot water units with or without circulating pump.

Type No. 2140 showing hook-up of Sampsel Controls on Unit Heater.

SAMPSEL UNIT HEATER CONTROL

Consists of B-40 Combination Relay and Transformer; S-21 two wire, low voltage Thermostat. Reduces high voltage wiring to minimum. Fused service switch eliminates necessity of additional entrance switch. Height 9": width 7½": depth 5". Motor rating ½ H. P. Electric capacity 115 volts A.C., 60 cycle, single phase. B-40 Combination Relay and Transformer may be purchased separately for use with other installations to eliminate the use of extensive high voltage wiring.

Type 5871 TIME-CONTROLLED SWITCH

Model S-21X COOLING THERMOSTAT

Model B-40 AF TRANS-FORMER and RELAY

SAMPSEL TIME-CONTROLLED SWITCH

Package Unit 5873 designed to control the operation of attic fans and evaporator coolers. Consists of S-21X Cooling Thermostat; No.5871 Time-Controlled Switch; and B-40 AF Combination Relay and Transformer.

Package Unit 8067 Automatic Time Control Unit for the operation of brooders, signs, etc. Consists of B-40 AF Combination Relay and Transformer; and No. 5871 Time-Controlled Switch.

- **SAMPSEL RELAY and TRANSFORMER COMBINATIONS**
- **TRANSFORMERS**
- **RELAYS**
- **PUMP SWITCHES**

This is but a part of the SAMPSEL line of CONTROLS. Complete Catalog available on request.

SAMPSEL TIME CONTROL, INC., Spring Valley, Illinois

Sampsel
AUTOMATIC CONTROLS

GAS

Mueller Type 101 Gas-Fired Gravity Furnace — Highly efficient radiator design. For small and medium-size homes.

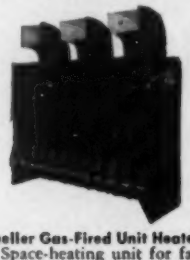
Mueller Type 107 — All-cast-iron winter air conditioner for basement or utility room installation.

Mueller Series SHP Steel Gas-Fired Winter Air Conditioner — Attractive, cabinet type for utility room or basement.

Mueller EPS Gas-Fired Winter Air-Conditioning Furnace — Sectional type forced-air units. For residential usage.

Mueller Type 20 Gas-Fired Boiler — Steam, hot water, or vapor heating. For larger residences, commercial and industrial buildings.

Mueller Type 10 Gas-Fired Boiler—for steam, hot water, or vapor. For residences and small commercial and industrial installations.



Mueller Gas-Fired Unit Heaters — Space-heating unit for factories, warehouses, hangars, shops. Compact, economical, and efficient.

Mueller Type 500 Gas-Fired Conversion Burner — Designed for quick, easy installation. Baffle and burner engineered for high combustion efficiency.

True Indoor Comfort for any home...with any fuel

That's really something to sell! And it's exactly what you can offer, when you are a Mueller Climatrol "comfort merchant"

Yes, it pays to be a Climatrol Comfort Merchant. Under normal delivery conditions, the complete Climatrol line enables you to meet every Indoor Comfort requirement with the exact size and type Climatrol unit for each job; each unit is specially designed for efficiency and economy with a specific fuel — gas, oil, or coal.

More important still, Climatrol comfort-equipment is engineered on the sound basic principle of "climate control" through the conditioning and handling of air—the simple, direct approach to True Indoor Comfort. Climatrol wins the good will of your customers by meeting today's high comfort standards, and retains it for years to come — for each unit is designed to be easily adapted to future air-conditioning developments.

Each Climatrol unit is smartly styled to win the approval of your design-conscious customers — and engineered for maximum comfort, convenience, and economy.

Your customer is proud to own equipment bearing Mueller's nationally-known and nationally-advertised name — and he knows he can count on Mueller's 90-year performance-record to deliver the certain satisfaction of True Indoor Comfort. Build your future on Climatrol—it pays!

MUELLER Climatrol

MEMBER INDOOR COMFORT

Reg. U. S. Pat. Off.

COAL

Mueller Coal-Fired Cast-Iron Furnace — Cast-iron gravity type.

Mueller All-Cast-Iron Coal-Fired Winter Air Conditioner — All parts completely enclosed in one cabinet.

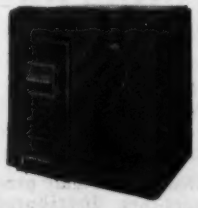
Mueller WG-42 All-Cast-Iron Coal-Fired Gravity Furnace — Capacity 42,000 Btu output at register. Standard return-flue radiator.

Mueller WR-72 Coal-Fired Winter Air Conditioner — Capacity 72,000 Btu output at bonnet. All cast-iron.

Mueller Double-Radiator Furnace—Gravity type. Tubular design—heavy cast-iron construction.

Mueller Double-Radiator Furnace—Forced-air type. Tubular design and heavy cast-iron construction.

Mueller Coal-Fired Steel Furnace — Gravity type.



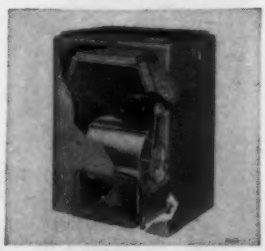
Mueller Steel Coal-Fired Winter Air Conditioner—All parts completely enclosed.

OIL

Mueller Series 50 Oil-Fired Winter Air-Conditioning Furnace—Small size with either vaporizing or pressure-atomizing burner. Two larger sizes with pressure burner only.

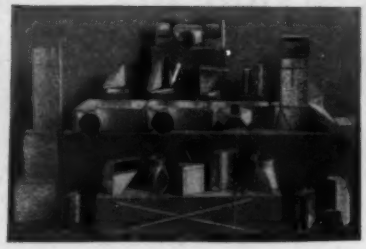
Mueller Series 201 Oil-Fired Gravity Furnace — Equipped with vaporizing oil burner.

Mueller Series 202 Oil-Fired Winter Air Conditioner — Equipped with vaporizing oil burner.



Mueller Blowers — For residential, commercial, and industrial applications. For heating, ventilating, air-conditioning, and processing.

Mueller Furnace Pipe, Ducts, and Fittings — Single- and double-tin and galvanized-iron gravity fittings. Pre-fab forced-air duct systems.



L. J. MUELLER FURNACE CO.

2010 W. OKLAHOMA AVENUE • MILWAUKEE 7, WISCONSIN

D-69

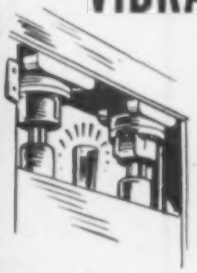
"More Profitable than

QUIET...

IT WOULDN'T WAKE A BABY

Easy, even hydraulic pressure does the work. No jarring impact as the die bottoms. No shock to the worker to lessen efficiency.

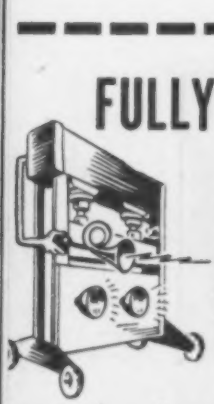
VIBRATIONLESS



GLASS OF WATER ON THE PLATEN, YOU'LL NEVER SPILL A DROP

That's how evenly pressures are distributed over the unit. That too, is another reason why dies last longer in a KRW.

FULLY EQUIPPED



EVEN TO HEADLIGHTS AND HORN IF YOU WANT 'EM

Connect to your 220 line, install your dies, and you're ready to go for bigger profits. Each unit is equipped with adequate power plant to meet your needs.

DEFLECTION NIL

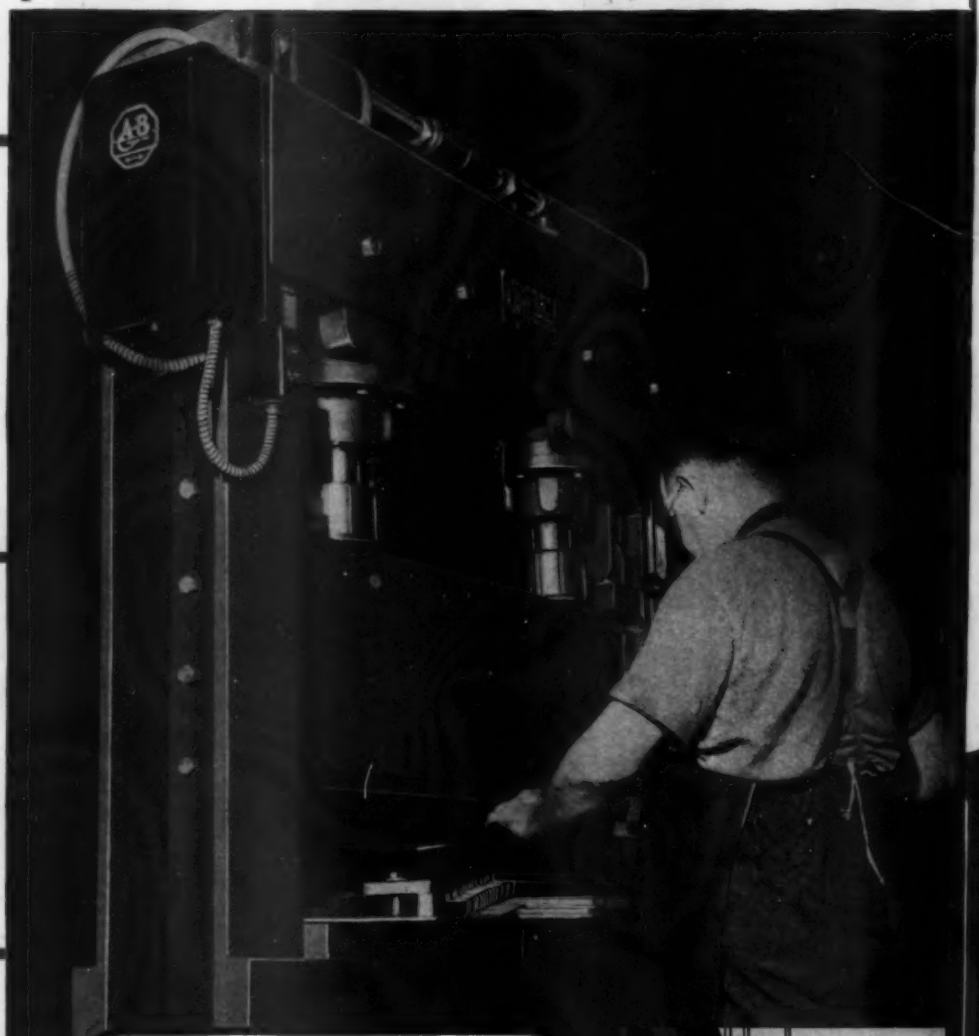
NO SWAYBACK PLATENS TO WORRY ABOUT

Where pressures require it, bed rails, platens and head are trussed and ribbed to eliminate any deflection. Press illustrated stamps three jambs per stroke.

MOBILE...

PUT IT ON CASTERS IF YOU WANT TO

It weighs only 5,500 lbs., and because it is hydraulically operated, with pressures evenly distributed, no foundation bed is necessary. The secret to this is KRW's welded design.

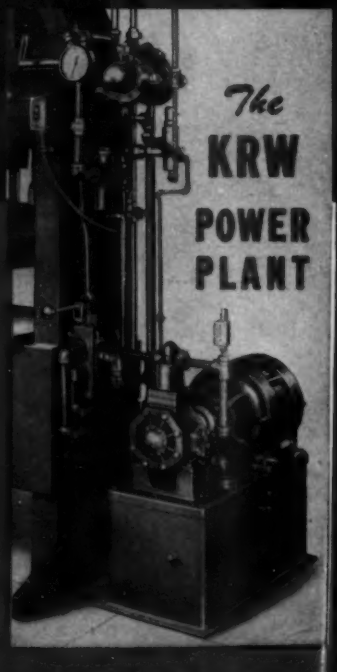


Specifications

KRW 100-TON PRESS BRAKE

Upper Platen	2½" x 14" x 44"
Lower Platen	2" x 12" x 44"
40 Strokes per minute	
Floor Space Req. Incl. Power Plant	42" x 80"
Overall Height	94"
Weight Incl. Power Plant	5,500 lbs.
Ram Pressure 100 tons	
Automatically Controlled Stop	

Can be made as gap type, or with open or closed ends. Distance between uprights and length of platens can be increased or decreased, depending on your needs.



Politics or Stamping Silver Dollars!"

...K. R. Wilson

THIS 100-TON KRW HYDRAULIC PRESS BRAKE PRODUCES JAMB SECTIONS FOR 2000 WINDOWS A DAY AT A FRACTION OF THE COST OF HEAVIER EQUIPMENT ... HOLDS WORKER FATIGUE TO A MINIMUM!

This press had been in operation only a few days before the Wendling Iron Works of Buffalo ordered three more—that's how satisfactory it proved in use. Now it is turning out 4,000 jamb sections for 2,000 windows, illustrated below, in two 8-hour shifts a day. No longer is it necessary to buy tons of unnecessary weight in a press in order to get efficient production. KRW welded construction plus scientific distribution of stress and load has radically changed all that. This 100-ton KRW press weighs a fraction, and costs a fraction of comparable equipment.

Because this press is hydraulically operated and not mechanically driven, it is quiet and almost vibrationless in operation. The press cannot be jammed by careless operation—the platen can be stopped and reversed at any point in its travel. Two heavy-duty cylinders develop controlled pressure to perform the work. Pressure is perfectly equalized between these cylinders by the exclusive KRW mechanical linkage and torque bar arrangement. Pump equipment varies depending upon customer requirements. This press can be engineered as a gap type or with open or closed ends. Platens will take standard dies. Adaptable for all light metal press work. Write for details, or better still, tell us what you want to accomplish and we'll quote you specifically. Mail the coupon.

DIES QUICK DELIVERY TO YOUR SPECIFICATIONS

We have arranged dependable connections for the manufacture of all types of dies for KRW Press Brakes. Send us your blueprints and specifications for accurate costs and delivery date.

4,000 jamb sections, 2,000 windows a day. That's production. Jamb is formed in two operations, first operation shown at right.

Formed from 14 Ga. hot rolled steel.

K. R. WILSON

215 MAIN ST. BUFFALO 3, N. Y.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please give me the facts regarding the KRW 100-ton Press Brake.

Name .....

Address .....

City ..... Zone..... *State*.....

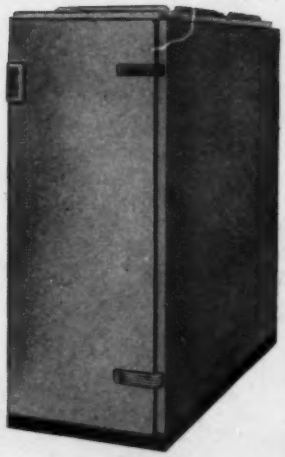
Capacity and size needed.....

.....

NOW — OUT
STILL
...for

HEATING EQUIPMENT THAT'S *"Years Ahead"* WITH...

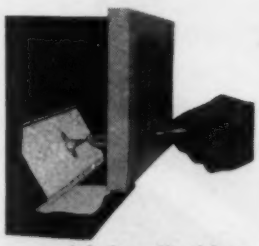
- ★ *RECOGNIZED VALUE LEADERSHIP*
- ★ *LONG-TERM PUBLIC FAVOR*
- ★ *HIGHEST CALIBRE ENGINEERING*
- ★ *HIGHEST QUALITY MANUFACTURING*



Series L
Gas-Fired, Steel
Air Conditioning
Unit

MONCRIEF'S SUREFIT FITTINGS

● With Moncrief's complete line of SUREFIT FITTINGS you get . . . streamlined production . . . save time . . . save money . . . increase profits.



MAYN AIR STACKHEAD DAMPERS

(1) Install with 3 sheet metal screws.
(2) Locks automatically when proper adjustment is obtained.
(3) Save money 3 ways—cost of damper; cost of installing; cost of balancing, which is a one-man job.

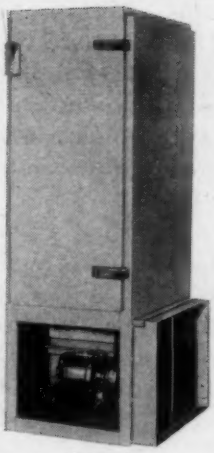
All Moncrief Gas-fired Units have passed the latest requirements of the A.G.A.

THE HENRY FURNACE COMPANY

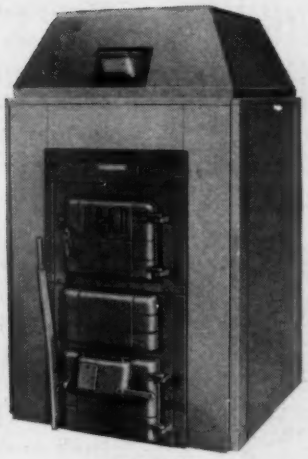
Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

T OF A GREAT PAST comes a L GREATER FUTURE... r MONCRIEF DEALERS!



Series U
Gas-Fired, Steel
Utility Air Conditioning Unit



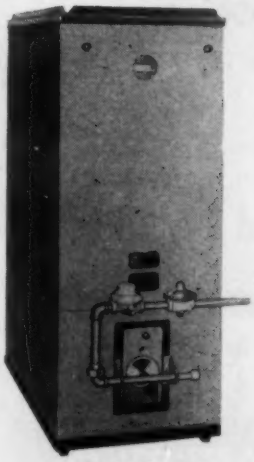
Series 700
Coal-Fired, Steel
Gravity Furnace

Series C
Coal-Fired, Cast
Gravity Furnace

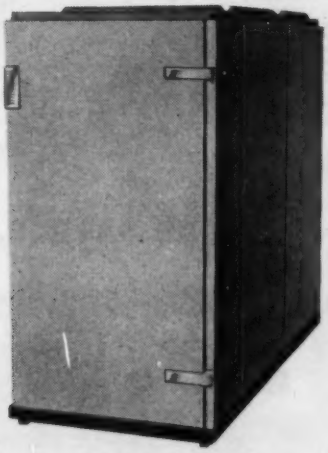
● The word "Moncrief" for over half a century has been synonymous with top-notch heating equipment.

Now, as in the past, Moncrief's top-notch ranking is more than outstanding—outstanding with a line of heating equipment that's "Years Ahead" in design and engineering achievements—with "Eye Appeal—Buy Appeal." That's why Moncrief dealers can again look to a future of greater profits—greater prestige.

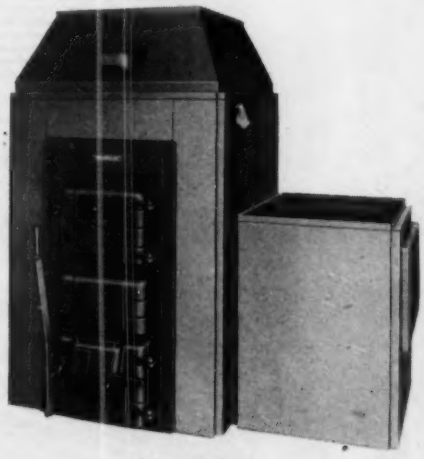
Face the future with Moncrief—easier to sell . . . easier to install . . . easier to service . . .



Series W
Gas-Fired, Steel
Gravity Furnace

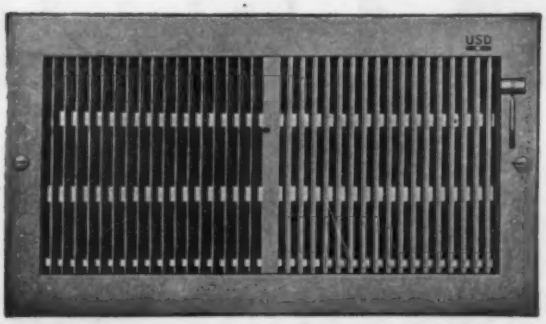


Series P
Oil-Fired, Steel
Air Conditioning Unit

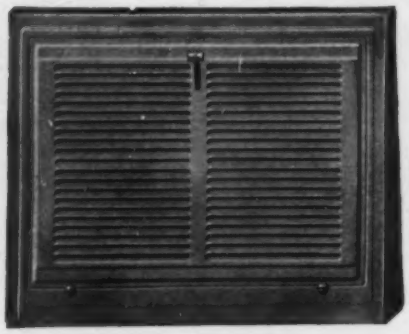


Series AC-700
Coal-Fired, Steel
Air Conditioning Unit

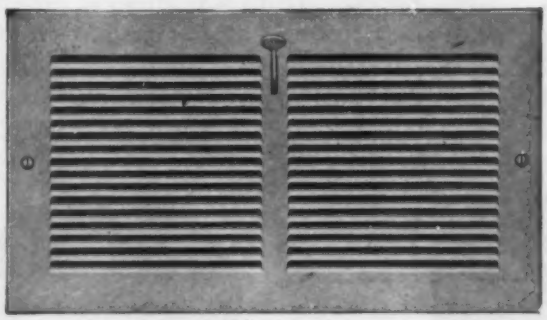
What holds Auer Customers?



No. 4432 Airo-Flex Multi-Louvre Adjustable Face Register



No. 800 Heat-Rite 2-Piece Gravity Baseboard Register



No. 7032 Airo-Flex Single Louvre Adjustable Face Register

The answer is that Auer has always made fine products, conservatively priced, and that Auer pays close personal attention to the individual needs of every customer. Steadfast adherence to high standards in registers and grilles, as well as conscientious cooperation to satisfy you in every detail of service, has paid off, both for you and for us. We value the high type of accounts we have, and we believe *they* value our continued efforts to please them.

We like to have you consider us as not only your first and most dependable source of supply, but as always ready to render you the kind of service which has made countless loyal, long time friends for THE AUER REGISTER COMPANY. For 1947—good luck and good registers!

Ask for Auer Register Book, or special Grille Catalog.

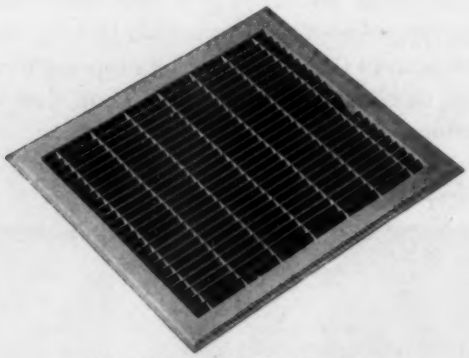


Fig. DR DuraBilt Floor Register

THE AUER REGISTER CO., 3608 Payne Avenue, Cleveland 14, Ohio

Auer REGISTERS
& GRILLES for AIR CONDITIONING & GRAVITY

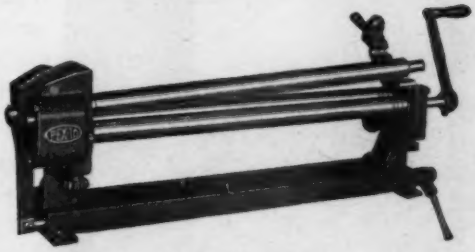
PEXTO *Specialized* MACHINERY AND TOOLS

FOR MODERN SHEET METAL FABRICATION

Beading Machines

Bar Folders

- Performance-proved in the industry's leading shops, large and small, since 1785.
- A specialized machine for every essential operation or combination of operations. . . in a full range of capacities and types . . . both manual and power driven.
- Simple, sturdy designs for low maintenance and year in, year out service.
- Experienced sheet metal workers everywhere prefer the dependable PEXTO brand.

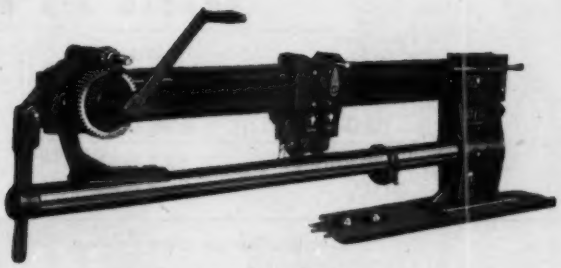


Slip Roll Formers

Combination Rotary Machines

Squaring Shears

Motor Driven Combination Rotary Machines

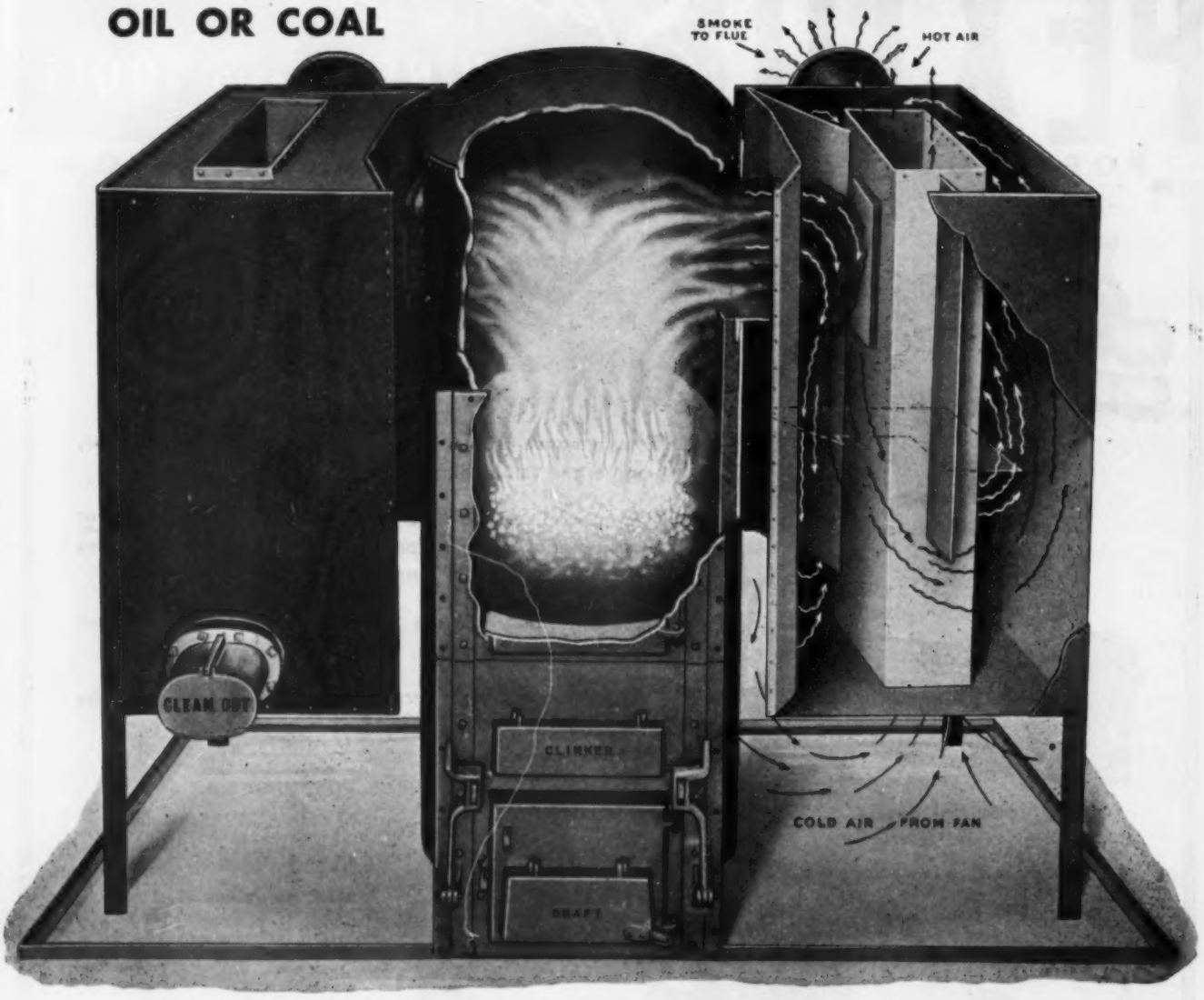


Grooving Machines

THE PECK, STOW & WILCOX COMPANY *Since 1785* **SOUTHINGTON, CONNECTICUT, U.S.A.**

PEERLESS *Commander* Heavy-Duty FURNACE

OIL OR COAL



SPECIFICATIONS—PEERLESS *Commander* No. 750 DR

Diameter Drum (obround)	Height of Drum	Height of Radiator	Grate Area Sq. in.	Grate Area Sq. Ft.	Heating Surface Sq. in.	Heating Surface Sq. Ft.	Ratio Heating Surface to Grate Area	Height to Bottom of Smoke Pipe Collar	Diameter Smoke Pipe	Casing Size	Casing Height	Shipping Weight—Lbs. Less Casing	Shipping Weight—Lbs. With Casing
31½"x48"	66"	46"	1048	7.28	30,959	215	29.55	49½"	14"	91"x58"	75"	3340	3855

FORCED AIR RATINGS

BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU	BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU
11,500	7.5 10.0	486,000 698,000	12,500	7.5 10.0	528,000 759,000
12,000	7.5 10.0	507,000 728,000	13,000	7.5 10.0	549,000 789,000

Specifications on other Peerless Heavy Duty furnaces on request.

Wire or Write for Descriptive Literature and Complete Information on other sizes of Peerless Warm Air Furnaces.

THE PEERLESS FOUNDRY COMPANY, Indianapolis, Ind.

Pioneers in Warm Air Heating for Over a Third of a Century

PEERLESS *complete line of warm air heating equipment*

It makes no difference—Automatic, Stoker fired, or Hand Fired, PEERLESS has the furnace to meet any warm-air heating requirement.

THE PEERLESS line includes three outstanding achievements in warm air furnaces. (See photos at right). All incorporate many refinements in design and construction which assure the home owner of dependable, economical and efficient performance . . . and which also assure the dealer of maximum sales appeal and customer satisfaction with minimum post-sale service.

In the PEERLESS "Master", you can offer the "last word" in automatic furnaces using oil or gas. And for those who prefer a coal or coke installation, there's a choice of two models—the "Sensation," a modern and efficient square cased steel unit . . . or the "Round-Cased" Steel furnace famous for reliable, low-cost operation.

You can depend on Peerless furnaces, as they have all the superior features of design and construction which have made them famous for nearly half a century.

So to take full advantage of the profit-making possibilities in the lucrative home building and remodeling market, be sure you are equipped with the complete line of PEERLESS furnaces and PEERLESS fittings and heating supplies.

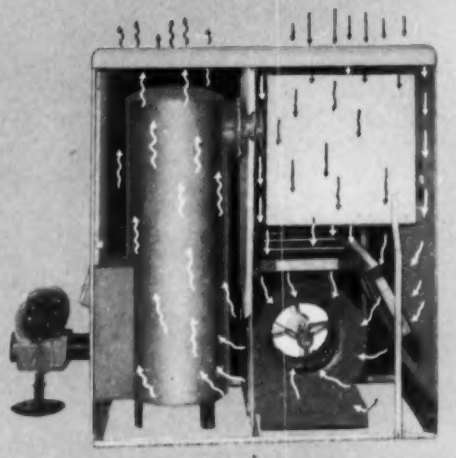
ORDER REPAIR PARTS FROM PEERLESS

PEERLESS still furnishes repair parts for most makes and models of warm air heating plants. The demand for both new equipment and repair parts is heavy, so assure early delivery by ordering now.

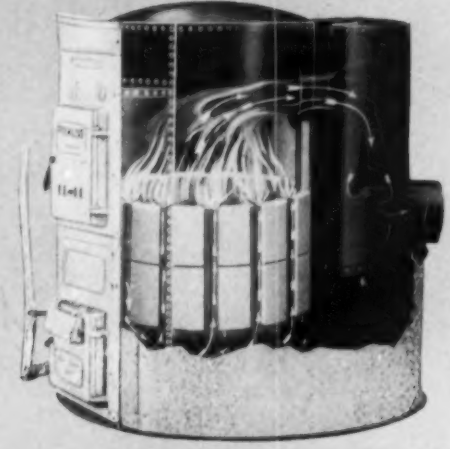
PEERLESS FOUNDRY CO.
1855 LUDLOW AVENUE; INDIANAPOLIS 7, INDIANA

PEERLESS FOUNDRY COMPANY
Pioneers in Warm Air Heating Equipment for almost half a century

THE SENSATION
FOR STOKER OR HAND FIRED
A steel furnace equipped with large silent blower, filters, and automatic humidifier.



THE MASTER FOR OIL OR GAS
An automatic furnace designed for small or medium size homes.

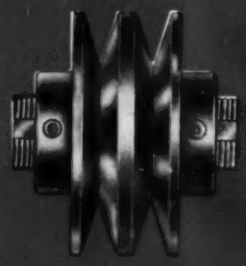


THE STEEL ROUND-CASED
FOR STOKER OR HAND FIRED
A Peerless Furnace built for long dependable and economical service.

The Answer to your

V-PULLEY PROBLEMS

Cast Iron
Single Groove Spoke Pulley



Cast Iron Two-Groove
Variable Pitch Diameter Pulley

Cast Iron Single Groove
Variable Pitch Diameter Pulley

Maurey V-Pulleys, once installed, perform continuously without attention. Their quality is taken for granted, because users quickly recognize the superior Maurey design and sturdiness.

Use Maurey V-Pulleys for trouble-free performance.

MAUREY V-PULLEYS

MAUREY MANUFACTURING CORP. — 2919 South Wabash Ave., Chicago 16, Ill.

No other control system offers all these outstanding advantages...

- SELF-OPERATED, NO OUTSIDE CURRENT REQUIRED
- SIMPLIFIED TWO-WIRE CONTROL
- ACCURATE ROOM TEMPERATURE CONTROL
- INTEGRAL SAFETY CONTROL
- SILENT OPERATION

AUTOMATIC, SAFE, SILENT AND SELF-OPERATED

A completely self-contained and self-operating control system. For natural, manufactured or L. P. gases. For all kinds of domestic, commercial or industrial applications. System consists of the B-60 pilot operated diaphragm type gas valve, the T-80 Series Trimtherm Thermostat, which is scientifically correct in design, and the ingenious pilot generator which produces the operating current, safety control, and main burner ignition. The B-60 Series of controls has set new standards throughout the gas industry. • For complete specifications on the *GENERAL CONTROLS* line of *Automatic, Pressure, Temperature and Flow Controls*, see the new 1946 Catalog 52C. • For Gas Heating Controls, request Service and Instruction Manuals.

GENERAL CONTROLS

Manufacturers of Automatic, Pressure, Temperature & Flow Controls

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

The Armco Distributor is "in there pitching" for you

He's part of a three-way team: You have the skill and experience in sheet metal working. We at Armco are turning out special-purpose iron and steel sheets on a round-the-clock schedule. And the capable, resourceful Armco Distributor is "in there pitching" to serve your personal interests.

Yes, he's hard at work for you. We wish you could see the pile of steel orders from distributors that reach our offices every day—orders that represent six years of pent-up civilian demand.

Naturally you are eager to get those special-purpose Armco sheet metals that have served your customers so well in the past and have helped spread your reputation for fine, workmanlike jobs: Paint-holding ARMCO Galvanized PAINTGRIP Steel . . . ARMCO Stainless Steels with their gleaming, rustless qualities . . . easy-working, well-known galvanized ARMCO Ingot Iron. Armco Mills are running full blast to produce more and more of these popular metals.

Keep in touch with your Armco Distributor because every week brings him nearer the time when he can give you more of the steel and the extra services you want. The American Rolling Mill Company, 141 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

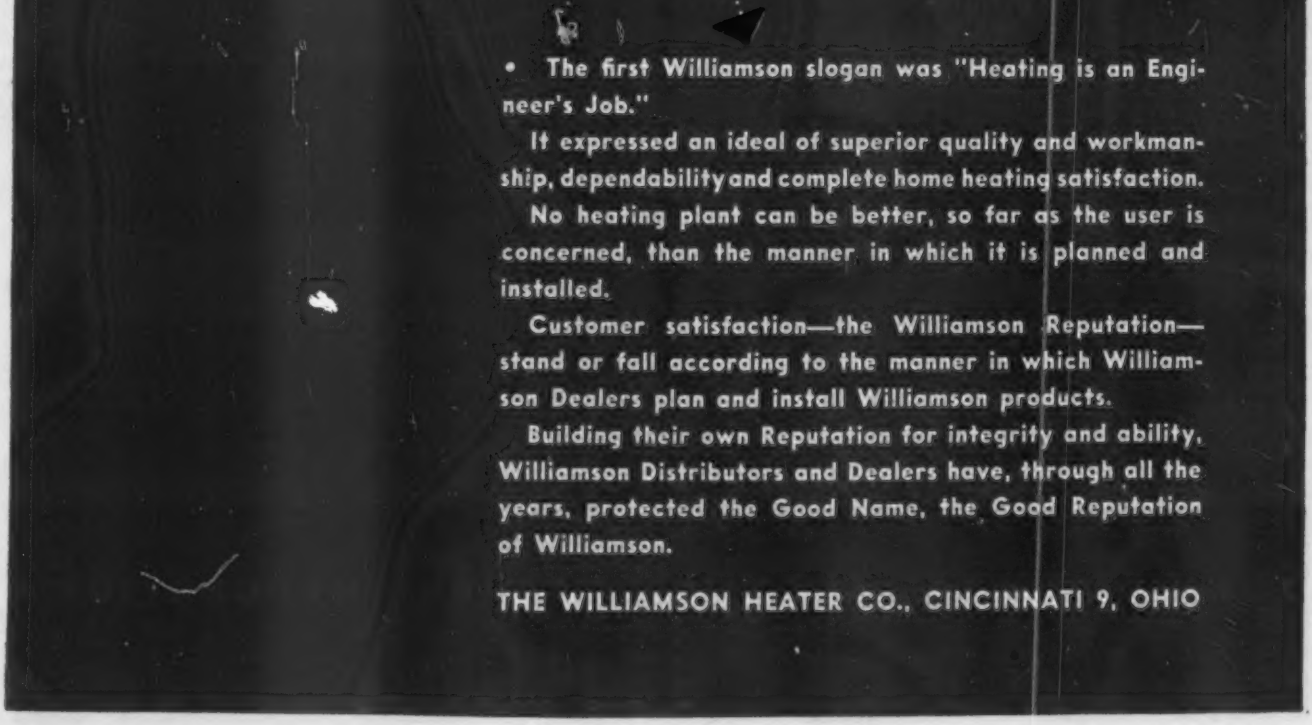
ARMCO

THE AMERICAN ROLLING MILL COMPANY

• SPECIAL-PURPOSE SHEET STEELS • STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE

THE WILLIAMSON HEATER COMPANY

protecting a good reputation



• The first Williamson slogan was "Heating is an Engineer's Job."

It expressed an ideal of superior quality and workmanship, dependability and complete home heating satisfaction.

No heating plant can be better, so far as the user is concerned, than the manner in which it is planned and installed.

Customer satisfaction—the Williamson Reputation—stand or fall according to the manner in which Williamson Dealers plan and install Williamson products.

Building their own Reputation for integrity and ability, Williamson Distributors and Dealers have, through all the years, protected the Good Name, the Good Reputation of Williamson.

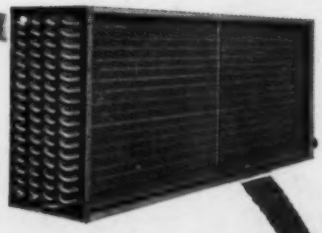
THE WILLIAMSON HEATER CO., CINCINNATI 9, OHIO

usAIRco Equipment

ENGINEERED AND MANUFACTURED FOR
EVERY AIR CONDITIONING NEED!

usAIRco BLOWERS

Specified and used for all types of air conditioning, heating and ventilating in public buildings, industrial and commercial applications. Quiet in operation, economical and long-lasting.

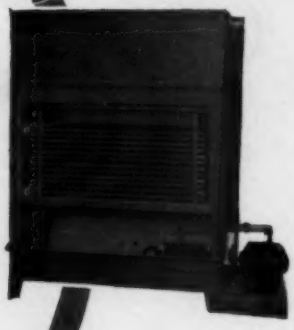


usAIRco COOLING AND HEATING COILS

usAIRco manufactures steam coils for heating (standard and non-freeze type), water coils for cooling and heating and direct expansion coils.

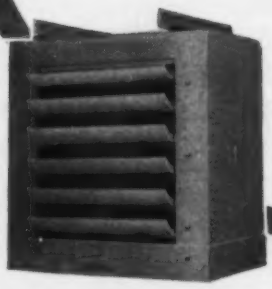
usAIRco REFRIGERATED KOOLER-AIRE

A single compact unit that combines cooling and dehumidifying—refrigeration compressor and evaporative condenser all in one balanced assembly. Capacity 3 to 40 tons.



usAIRco EVAPORATIVE CONDENSER

A packaged cooling unit for condensing refrigerants with minimum water costs.



usAIRco UNIT COOLERS

These units are manufactured in nine sizes for varied commercial and industrial applications including both low temperature operations and ordinary comfort cooling. Unit Coolers are designed for efficient and trouble-free operation.

usAIRco UNIT AIR CONDITIONERS

Packaged air conditioning units engineered to provide low-cost comfort cooling. Used for cooling and dehumidifying. Combination units provide winter heating and summer cooling.

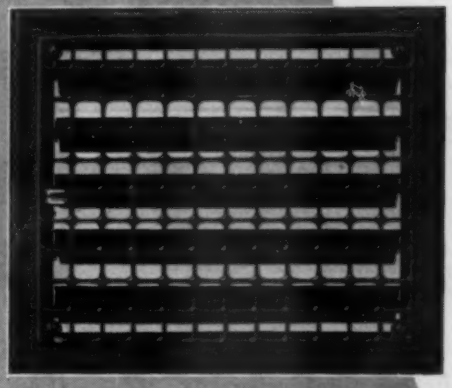
usAIRco Air Conditioning EQUIPMENT

UNITED STATES AIR CONDITIONING CORPORATION

Como Ave. S.E. at 33rd, Dept. K Minneapolis, Minn., U.S.A. • 420K Lexington Ave., New York City, U.S.A.

H & C No. 130 — the best designed, best made Baseboard Register for Gravity or Reconversion.

H & C No. 75 Design — the only A.C. Register to employ the incomparable Turning Blade Valve.



Above: H & C No. 200 Steel Floor Register. Made in 6x8, 8x10, 8x12, 9x12, 10x12, 12x14. Finishes: Black and Oak. Class 200 List and Discount are same as Class 210.

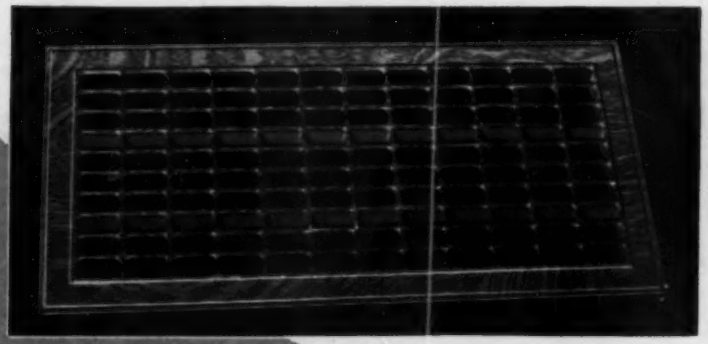
Right: H & C No. 255 Steel Return Air Face. Made in 6x30, 8x30, 10x24, 10x30, 12x14, 12x24, 12x30, 14x30, 16x30, 18x30, 20x30. Finishes: Black and Oak. Class 255 List and Discount are same as Class 265.

For '47

There'll be *NO BREAK* in our Intensive Effort to SERVE YOU —

Every effort humanly possible is being exerted throughout the entire H & C organization to meet the huge demand for registers. Production schedules are as heavy as steel and manpower will permit but the demand for H & C products is unprecedented and orders now on file are so heavy that early shipment of new orders is impossible.

The most important way in which you can definitely help us to supply you with the maximum number of registers in the shortest possible time, is to accept *either* No. 200 or No. 210 Floor Registers, and *either* No. 255 or No. 265 Faces in the standardized sizes listed. The Nos. 200 and 255 are entirely comparable to the Nos. 210 and 265 in efficiency and can be made at a much more rapid rate. We pledge that we will continue to bend every effort to give you the best delivery possible under very difficult circumstances.



H&C

HART & COOLEY MANUFACTURING CO., HOLLAND, MICH.

World's Largest Manufacturers of Registers, Grilles and Furnace Accessories

How to Select Controls *that . . .*
in HOME HEATING *and*

SERIES 120 — ROOM THERMOSTATS

From your customer's viewpoint, the thermostat is the most important control of the heating system. Specify a Series 120 for reliable performance and for smart design which harmonizes perfectly with any scheme of room decoration.

SERIES 130 — ROOM THERMOSTATS

White-Rodgers Series 130 thermostats provide the same dependable performance as the Series 120 but are designed for those who prefer the thermometer and adjusting knob to be visible. Types are available in both series with special timing mechanisms for automatically reducing the night-hour temperature setting.

SERIES 150 — HEAVY DUTY THERMOSTATS

Modern in design, these line-voltage thermostats are especially appropriate for use on heating and air-conditioning installations in theatres, public buildings, schools, stores and show rooms where appearance is important and where positive, accurate control is required. Ideal for use on unit heaters and unit coolers. No relay necessary on most installations.

SERIES 400 — WARM-AIR SAFETY CONTROLS

Protects furnace against excessive temperatures which may prove dangerous and wasteful of fuel. Dials shown in degrees Fahrenheit permit quick and accurate settings for each installation. Types for Gas, Oil or Coal-fired furnaces. Line or low voltage.

SERIES 500 — FAN CONTROLS

Hydraulic-Action principle provides accurate control of fan or blower operation on forced warm air systems. Exact settings with visible dial and easily adjusted indicators. Positive accuracy at any point in dial range.

SERIES 500 — FAN AND LIMIT CONTROLS

The most widely used in the warm-air field today. Provide accurate fan control and positive safety-limit protection. Flush mounting and simplified installation is possible with flexible Hydraulic-Action elements. Direct-reading dials permit quick, accurate settings. Differential is constant — no temperature drift.

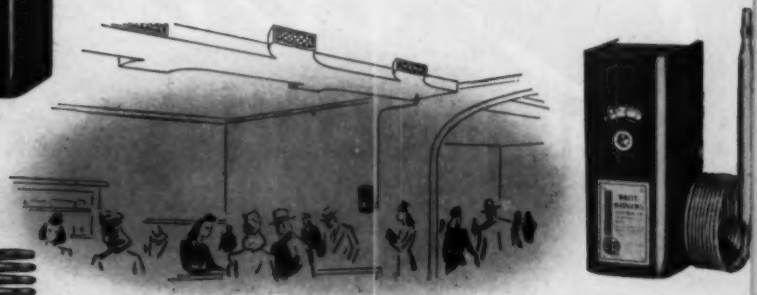
WHITE-RODGERS ELECTRIC CO.

Guarantee Complete Satisfaction

AIR CONDITIONING

SERIES 200 — SPACE THERMOSTATS

Heavy duty, line voltage thermostats with specially designed, quick responding Hydraulic-Action sensitive element. For use in factories, garages, warehouses and similar applications where changes in temperature are often more rapid than usually encountered.

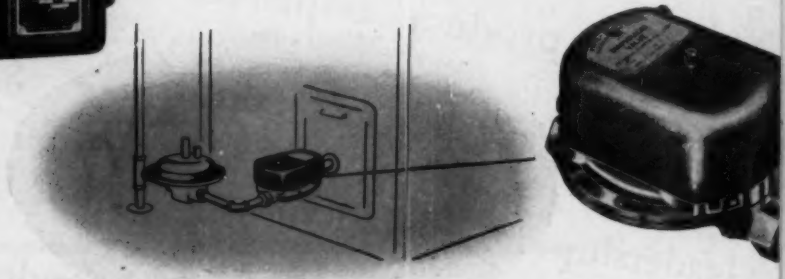


SERIES 200 — REMOTE BULB THERMOSTATS

Heavy duty, line voltage, Hydraulic-Action thermostats, particularly well suited for controlling duct temperatures on air conditioning and warm air heating systems, especially where excess moisture and condensation may be present in the controlled area.

SERIES 200 — EXPLOSION PROOF THERMOSTATS

Line voltage, heavy duty Hydraulic-Action thermostats designed for heating and air conditioning applications where hazardous conditions exist, such as oil refineries, grain elevators, flour mills, mines, munition plants, etc. Underwriters' approved (Class I, Group D; Class II, Groups E, F and G).

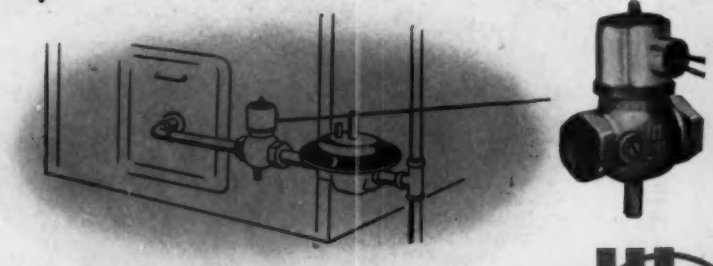


SERIES 2600 — DIAPHRAGM GAS VALVES

These valves are for use with Natural, Manufactured or Mixed Gas and readily adaptable for all types of domestic and small industrial heating systems. Preferred by utilities for their complete accessibility and positive, reliable operation. May be operated manually in case of power failure. Also available with built-in limit for warm air or hot-water installations.

SERIES 3000 — GAS SAFETY PILOTS

Prevents opening of main gas valve if pilot flame is out or too low to ignite burner properly. Quick acting — automatic recycling, requires only relighting to put pilot back in operation. Operates on new principle developed by White-Rodgers to provide exceptionally efficient, dependable performance. Types for Natural, Manufactured or Mixed Gas.



SERIES 2500 — SOLENOID GAS VALVES

For gas-fired installations requiring a valve of small over-all dimensions these valves give unequaled performance. Improved engineering has eliminated magnetic hum and provided high plunger force to assure positive opening and closing of valve. Available for all types of gas. Line or low voltage.

Saint Louis 6, Missouri

Clarage

—HEADQUARTERS FOR AIR HANDLING AND CONDITIONING EQUIPMENT

For nearly 40 years--through constant product improvement-- Clarage has maintained leadership in this specialized field . . . Directing your air handling and conditioning requirements our way is to place them in capable hands . . . .

CLARAGE FAN COMPANY
KALAMAZOO, MICHIGAN

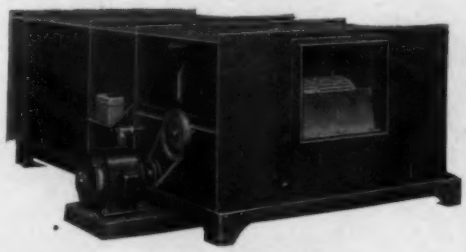
FURNACE AND
UNIT CONDITIONER FANS

UNICOIL
CONDITIONING UNITS

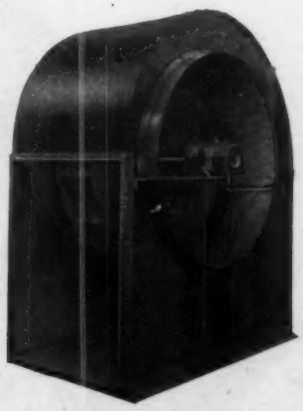
INDUSTRIAL
PROCESS FANS

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

AIR WASHERS
AND PURIFIERS



MULTITHERM
CONDITIONING UNITS



VENTILATING AND
CONDITIONING FANS

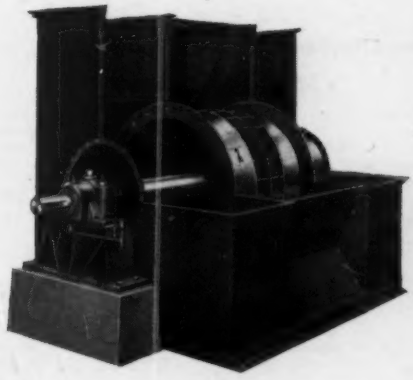
Shown here are but a few of the many units comprising the complete line of Clarage equipment.

To be of maximum help to architects, engineers, contractors, and to industry, we maintain branch offices in all principal cities. Each branch office is MANNED BY EXPERTS — *by Clarage application engineers!*

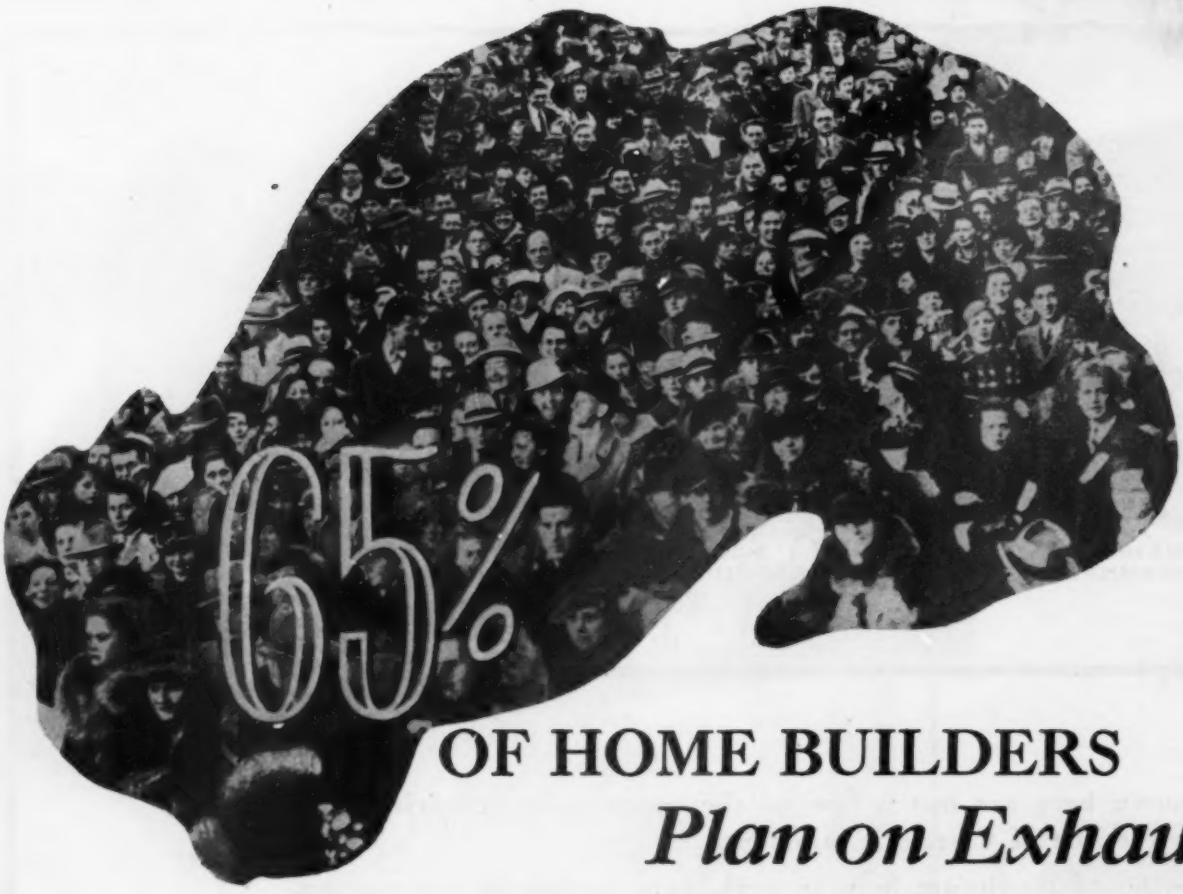
Consult your telephone directory for our address in your city, or write us at Kalamazoo.

UNITHERM
UNIT HEATERS

CLARCO
UNIT HEATERS



MECHANICAL DRAFT
EQUIPMENT



OF HOME BUILDERS *Plan on Exhaust*

TWO independent national surveys among persons who expect to build new homes soon, disclose that *65%* plan to install electric exhaust fans . . . That's a new profit opportunity for fan dealers.

Blo-Fan

***CEILING* VENTILATORS**

rate high in popularity because they combine the advantages of both breeze fan and blower. They deliver the *volume* of the breeze fan with the *power* of the blower. . . Blo-Fans are installed in the ceiling directly over the source of foul air, where unwanted odors, greasy vapors and steam can best be expelled as they rise—before they spread to soil ceilings, walls or furnishings.

Wide-awake dealers are installing Blo-Fans in kitchens, game-rooms, bathrooms and laundries. Any of the distributors listed on the opposite page will gladly give you further information. It pays to sell Blo-Fans, for "Blo-Fans make friends."

Blo-Fan

***CEILING* VENTILATORS**

- ***More than a Fan***
- ***More than a Blower***

PRYNE & CO. INC.

LOS ANGELES 54, CALIF.

NEW YORK • CHICAGO • HOUSTON • SAN FRANCISCO

ASK YOUR NEAREST FRANCHISED Blo-Fan DISTRIBUTOR

Fans!

ALABAMA
BIRMINGHAM — Mayer Electric Supply Co.
MONTGOMERY — Teague Hardware Company

ARIZONA
All Electrical Wholesalers

ARKANSAS
HOT SPRINGS — F. C. Stearns Hardware Co.

CALIFORNIA
All Electrical Wholesalers

COLORADO
DENVER — Central Electric Supply Co.
General Electric Supply Corp.

CONNECTICUT
BRIDGEPORT — General Electric Supply Corp.
Olschan Electric Supply Company
HARTFORD — Beacon Light & Supply Co.
Economy Electric Supply Co.
General Electric Supply Corp.
NEW BRITAIN — Spring & Buckley, Inc.
NEW HAVEN — General Electric Supply Corp.
Grand Light & Supply Company
STAMFORD — MarLe Co.
WATERBURY — General Electric Supply Corp.

DELAWARE
WILMINGTON — Art Craft Electric Supply Co.
General Electric Supply Corp.

DISTRICT OF COLUMBIA
WASHINGTON — Columbia Electric Supply Co., Inc.
Fries, Beall & Sharp Co.
General Electric Supply Corp.

FLORIDA
DAYTONA BEACH — Hughes Supply
GAINESVILLE — Baird Hardware Co.
JACKSONVILLE — General Electric Supply Corp.
Hajoca Corp.
Raybro Electric Supplies, Inc.
MIAMI — General Electric Supply Corp.
Raybro Electric Supplies, Inc.
ORLANDO — Hughes Electric Supply
PENSACOLA — Gulf Electric Supply Co
ST. PETERSBURG — Raybro Electric Supplies, Inc
TALLAHASSEE — McGowan Electric Supply Co.
TAMPA — General Electric Supply Corp
Raybro Electric Supplies, Inc

GEORGIA
ATLANTA — General Electric Supply Corp.
The Electric Supply Co
AUGUSTA — Hart Electric Supply Co.
COLUMBUS — P & W. Electric Supply Co.
MACON — Lowe Electric Co

IDAHO
BOISE — General Electric Supply Corp.

ILLINOIS
AURORA — Schuner Electric Supply
CENTRALIA — Travelectric Co.
CHICAGO — Emjay Builders Supply Co.
General Electric Supply Corp.
Revere Electric Supply Co.
DANVILLE — Danville Electric Supply Co
ELGIN — Fox Electric Supply Co.
JOLIET — Barrett Hardware Co.
PEORIA — Knefer Electric Supply Co.
QUINCY — Crescent Electric Supply Co.
ROCKFORD — General Electric Supply Corp.
Rock River Electrical Supply Co.
SPRINGFIELD — General Electric Supply Corp.

INDIANA
ANDERSON — Peerless Electric Co.
EVANSVILLE — General Electric Supply Corp.
FT WAYNE — General Electric Supply Corp.
National Mill Supply Co.
GOSHEN — Goshen Electric Supply Co.
INDIANAPOLIS — General Electric Supply Corp.
Peerless Electric Supply Co.
KOKOMO — Wholesale Electric Service
LAFAYETTE — Kirby Risk Electric Co.
MARION — Universal Electric Co.
MUNCIE — Universal Electric Co.
SOUTH BEND — South Bend Electric Co., Inc.
TERRE HAUTE — Walker Electric Supply Co Inc.

IOWA
BURLINGTON — Crescent Electric Supply Co.
CEDAR RAPIDS — Van Meter Co.
DAVENPORT — Crescent Electric Supply Co.
DES MOINES — General Electric Supply Corp.
DUBUQUE — Crescent Electric Supply Co.
FT. DODGE — Iowa Electric Supply Co., Inc.
MASON CITY — Crescent Electric Supply Co.
SIOUX CITY — Crescent Electric Supply Co.
WATERLOO — Crescent Electric Supply Co.

KANSAS
KANSAS CITY — W. T. Foley Electric Co.
SALINA — Electric Fixture & Supply Co.
Lee Hardware Co.
TOPEKA — Kansas Electric Supply Co.
WICHITA — American Electric Co.
Heaven Engineering Co.

KENTUCKY
LOUISVILLE — General Electric Supply Corp.
Tafel Electric & Supply Co.

LOUISIANA
BATON ROUGE — Electrical Wholesalers, Inc.
NEW ORLEANS — General Electric Supply Corp.
Lighting Fixture & Electric Supply Co.
SHREVEPORT — General Electric Supply Corp.
Interstate Electric Co., Inc.

MAINE
LEWISTON — Lewiston Hardware & Plumbing Supply Co.
PORTLAND — General Electric Supply Corp.

MARYLAND
BALTIMORE — Dorman Electric Supply Co
Excello Public Service Corp.
General Electric Supply Corp.

MASSACHUSETTS
BOSTON — General Electric Supply Corp.
Mass. Gas & Electric Supply Co.
BROCKTON — Mass. Gas & Electric Supply Co.
CAMBRIDGE — EMF Electric Supply Co.
FALL RIVER — Brady Electric Supply Co.
FITCHBURG — Service Electric Supply Co
LAWRENCE — Dyer-Clark Co.
LYNN — Essex Electric Supply
NEW BEDFORD — Electric Service & Sales Co.
QUINCY — Granite City Electric Supply Co.
SALEM — Silver's Supply Co., Inc.
SPRINGFIELD — Carlisle Hardware Co.
General Electric Supply Corp.
WALTHAM — Waltham Supply Co., Inc.
WATERTOWN — Watertown Electric Supply Co.
WORCESTER — Atlantic Electric Supply Co.
General Electric Supply Corp.

MICHIGAN
BATTLE CREEK — Central Electric Supply Co.
BAY CITY — Meisel Hardware & Supply Co.
DETROIT — General Electric Supply Corp.
Madison Electric Co.
FLINT — Royalite Co.
GRAND RAPIDS — Electric Supply Co
General Electric Supply Corp.
KALAMAZOO — General Electric Supply Corp.
LANSING — General Electric Supply Corp.
Michigan Brass & Electric Co.
MUSKEGON — Fitzpatrick Electric Supply Co.
PETOSKEY — Brenmeyr-Bain Co.
PONTIAC — Standard Electric Co.
SAGINAW — General Electric Supply Corp.
Morley Brothers

MINNESOTA
DULUTH — General Electric Supply Corp.
MINNEAPOLIS — General Electric Supply Corp.
Northland Electric Supply Co.
Sterling Electric Co.
ST PAUL — Electric Supply Co.
Farwell, Ozmun, Kirk & Co.
General Electric Supply Corp.

MISSISSIPPI
JACKSON — Electric Supply Co.
General Electric Supply Corp.

MISSOURI
JOPLIN — General Electric Supply Corp.
KANSAS CITY — General Electric Supply Corp.
Glasco Electric Co.
Heaven Engineering Co.
SPRINGFIELD — General Electric Supply Corp.
Heaven Engineering Co.
ST. JOSEPH — American Electric Co.
ST LOUIS — General Electric Supply Corp.
Glasco Electric Co.

MONTANA
BUTTE — General Electric Supply Corp.
GREAT FALLS — Falls Supply Co.

NEBRASKA
CHADRON — Casper Supply Co.
LINCOLN — Kournemyer Co.
OMAHA — General Electric Supply Corp.
SCOTTSBLUFF — Casper Supply Co.

NEW HAMPSHIRE
DOVER — Ralph Pill Electric Supply Co.
MANCHESTER — Granite State Electric Supply Co

NEW JERSEY
ASBURY PARK — Rale Electrical Supply Co.
BLOOMFIELD — Bloomfield Electric Supply Co., Inc.
CAMDEN — Borstein Electric Co.
ELIZABETH — Jersey State Electric Co.
HACKENSACK — Lowenthal Electric Supply Co.
HOBOKEN — L & G Laikin
MORRISTOWN — Morristown Electric Supply Co.
NEWARK — Reliable Electric Supply Co.
Star Electric Supply Co.
NEW BRUNSWICK — New Brunswick Electric Supply Co.
ORANGE — C. M. Lantz
PASSAIC — National Electric Co.
Simon Brothers Electric Co.
PATERSON — Watson-Flagg Sales Corp.
White & Shauger, Inc.
PHILLIPSBURG — Warren Electric Supply Co.
PLAINFIELD — Hi-Pro Electric Supply Co.
TRENTON — Griffith Electric Supply Co.
UNION CITY — Hudson Electric Supply Co.

NEW MEXICO
ALBUQUERQUE — General Electric Supply Corp.
J. Korber & Co.
State Electric Supply Co.
SANTA FE — Santa Fe Builders Supply Co.

NEVADA
RENO — J. R. Bradley Co.

NEW YORK
ALBANY — Havens Electric Co., Inc.
BINGHAMPTON — Wehle Electric Co., Inc.
BROOKLYN — G. M. Ketcham Mfg. Corp.
BUFFALO — Bison Electric Co., Inc.
Davis Electric Supply Co.
General Electric Supply Corp.
Kenmore Builders Supply Co., Inc.
Wehle Electric Co., Inc.
ELMIRA — Wehle Electric Co., Inc
GLENS FALLS — Glens Falls Electric Supply Co.
ITHACA — Stallman of Ithaca
JAMAICA — Central Queens Lighting Fixture Corp.
KINGSTON — Kolts Electric Supply Co.
MT. VERNON — B. Davis
P. G. Supply Co.
NEW YORK CITY — General Electric Supply Corp.
Hirschfeld Electric Supply Co., Inc.
NIAGARA FALLS — General Electric Supply Corp.
OLEAN — LeValley-McLeod-Kinkaid Co., Inc.
POUGHKEEPSIE — Electra Supply Co.
ROCHESTER — General Electric Supply Corp.
S A Spencer
Wehle Electric Co., Inc.
ROME — Griffith Electric Supply Co.
SCHENECTADY — LeValley-McLeod-Kinkaid Co.
SYRACUSE — Edward Joy Co.
Gould-Farmer Co., Inc.
YONKERS — Graber Electric Supply Co.

NORTH CAROLINA
CHARLOTTE — General Electric Supply Corp.
GREENSBORO — Johannesen Electric Co., Inc.
RALEIGH — Scott Parish Electric Supply Co.
WINSTON-SALEM — Lambeth Electric Supply Co., Inc.

NORTH DAKOTA
FARGO — Dakota Electric Supply Co
MINOT — Dakota Electric Supply Co.

OHIO
AKRON — General Electric Supply Corp.
Sacks Electric Supply Co.
CANTON — Furbay-Summer Co.
General Electric Supply Corp.
CINCINNATI — General Electric Supply Corp.
Richards Electric Supply Co.
CLEVELAND — General Electric Supply Corp
Midland Electric Co.
COLUMBUS — General Electric Supply Corp.
Howard Bldg. Service Company
COSHOCTON — Wagner's
DAYTON — General Electric Supply Corp.
Martin Electric Co.
LANCASTER — Snyder Electric Co.
LIMA — Electric Supply Co.
TOLEDO — Anderson & Krapp
General Electric Supply Corp.
YOUNGSTOWN — General Electric Supply Corp.
Hood Electric Co.

OKLAHOMA
MUSKOGEE — Fullerton Electric Supply
OKLAHOMA CITY — Cook Electric Supply Co.
General Electric Supply Corp.
TULSA — General Electric Supply Corp.

OREGON
All Electrical Wholesalers

PENNSYLVANIA
ALLENTOWN — Allen Electric Co.
General Electric Supply Corp.
BLOOMSBURG — E. R. Beers Electric Co.
BRADFORD — Booth Electric Co.
CHESTER — Reddington Electric Co.
ERIE — General Electric Supply Corp.
HARRISBURG — Dauphin Electric Supplies Co.
LANCASTER — Jno. E. Graybill & Co.
MEADVILLE — Harley D. Carpenter
OIL CITY — Corrin Electric Supply
PHILADELPHIA — Taylor Albertson Co.
Broad Electric Supply Co.
General Electric Supply Corp.
W. Phila. Electric Supply Co.
PITTSBURGH — L. Paul O'Hara
READING — General Electric Supply Corp.
SCRANTON — General Electric Supply Corp.
WEST CHESTER — West Chester Elec. Supply Co.
WILKES-BARRE — General Electric Supply Corp.
YORK — Jno. E. Graybill & Co.

RHODE ISLAND
PROVIDENCE — General Electric Supply Corp.
Royal Electric Supply Company

SOUTH CAROLINA
CHARLESTON — Perry-Mann Electric Co.
COLUMBIA — Perry-Mann Electric Co.
SUMTER — Sumter Machinery Co.

SOUTH DAKOTA
ABERDEEN — Dakota Electric Supply Co.
RAPID CITY — Casper Supply Co.
SIOUX FALLS — Crescent Electric Supply Co.

TENNESSEE
CHATTANOOGA — General Electric Supply Corp.
Ramsey Electric Supply Co.
KNOXVILLE — General Electric Supply Corp.
Roden Electric Supply Company
MEMPHIS — General Electric Supply Corp.
NASHVILLE — General Electric Supply Corp.
Harris-Patrick Electric Supply Co.

TEXAS
ABILENE — General Electric Supply Corp.
Sun Electric Co.
AMARILLO — General Electric Supply Corp.
AUSTIN — Southern Electric Supply Co.
BEAUMONT — General Electric Supply Corp.
CORPUS CHRISTI — Corpus Christi Hardware Co.
DALLAS — General Electric Supply Corp.
Smith-Perry Electric Co.
EL PASO — General Electric Supply Corp.
FT. WORTH — General Electric Supply Corp.
Smith-Perry Electric Co.
HARLINGEN — Bush Supply Co.
HOUSTON — General Electric Supply Corp.
Southern Electric Supply Co.
Warren Electric Co.
LUBBOCK — General Electric Supply Corp.
Southwestern Electric Supply Company
SAN ANTONIO — General Electric Supply Corp.
Southern Equipment Company
WACO — General Electric Supply Corp.

UTAH
SALT LAKE CITY — General Electric Supply Corp.
United Electric Supply Co.
Westinghouse Electric Supply Co.

VERMONT
BURLINGTON — Vermont Hardware Co.

VIRGINIA
DANVILLE — Womack Electric & Supply Co.
LYNCHBURG — Mid-State Electric Supply Co.
NORFOLK — General Electric Supply Corp.
Goodman Electric Supply Company
RICHMOND — General Electric Supply Corp.
Tower-Binford Electric & Mfg. Co.
ROANOKE — General Electric Supply Corp.

WASHINGTON
SEATTLE — All Electrical Wholesalers
SPOKANE — Columbia Electric & Mfg. Co.
General Electric Supply Corp.
Inland Electric Co.
Westinghouse Electric Supply
TACOMA — All Electrical Wholesalers
WALLA WALLA — Electric Supply & Fixture Co.
YAKIMA — Inland Pipe & Supply Co.

WEST VIRGINIA
CHARLESTON — Virginian Electric, Inc.

WISCONSIN
APPLETON — General Electric Supply Corp.
FOND DU LAC — Central Electric Supply
GREEN BAY — Murphy Supply Co.
LA CROSSE — W. A. Rosevelt Co.
MADISON — Crescent Electric Supply Co
MANITOWOC — Rahr's Inc.
MILWAUKEE — Builders' Specialties, Inc.
General Electric Supply Corp.
OSHKOSH — Electrical Contractors Supply
SHEBOYGAN — Howald & La Page, Inc.

WYOMING
CASPER — Casper Supply Co.
CHEYENNE — Casper Supply Co.
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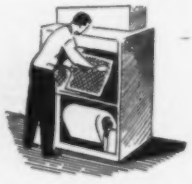
PRYNE & CO., INC., LOS ANGELES 54, CALIFORNIA

DUST STOPS...first in filters

T. M. Reg. U. S. Pat. Off.

WHEREVER AIR IS MECHANICALLY MOVED!



It is no accident that DUST-STOPS, the original replacement-type filters, are by far the most widely used in heating, ventilating and air-conditioning today.

Made up of packs of adhesive-coated Fiberglas* fibers, DUST-STOP Filters provide an efficient medium for catching and holding atmospheric and manufactured dust. Readily and inexpensively replaced when dirty, DUST-STOPS make possible a high standard of air filtering performance—easily maintained month after month, and at minimum costs.

Standard equipment in most modern warm-air furnaces, DUST-STOPS are equally "at home" in large filter installations for central systems, in packaged air-conditioning units, and in filter-equipped industrial machines. Availability of replacement filters everywhere simplifies maintenance for users.

If you are not familiar with DUST-STOP Filters, or with the ready-to-assemble DUST-STOP Steel Frame Cells for central systems, we invite your inquiry. Write Owens-Corning Fiberglas Corporation, Department 930, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario

*T. M. Reg. U. S. Pat. Off.

LOOK US UP IN
CLEVELAND
(Booth 652-654)
At the International Heating, Ventilating and Air Conditioning Exposition
Jan. 27-31, 1947

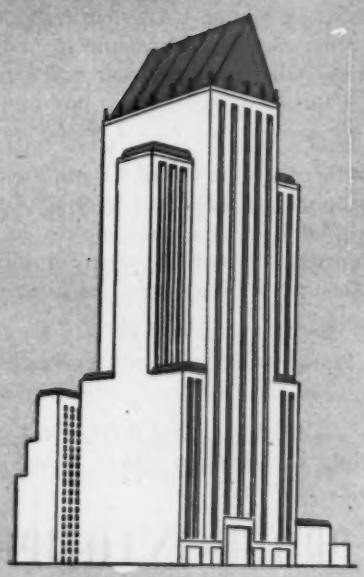
OWENS-CORNING
FIBERGLAS CORPORATION

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT
AIR CONDITIONING INSTITUTE

"Your partner whose Actions speak louder than words"

Protected for a Lifetime with HUSSEY COPPER

ROOFING AND BUILDING PRODUCTS



PRODUCTS FOR THE BUILDING TRADES

Copper Sheet • Copper Strip • Copper Nails and Rivets • Copper Ridge Rolls • Copper Eave Troughs • Copper Conductor Pipe

ON towering skyscraper or modest GI home . . . Hussey Copper roofing, flashing, ridge roll, eave troughs or conductor pipes mean a lifetime of protection against weather.

For Copper is truly the lifetime metal . . . a fact proved by hundreds of years' exposure on the roofs of Europe's most ancient buildings. Today, Hussey's modern production methods assure you a uniformly excellent, always true to gauge product, and at a low cost for specification in all building applications.

For durable and dependable quality in your construction jobs, specify Hussey Copper and Copper Products.

C. G. HUSSEY & COMPANY

(Division of Copper Range Co.)

***Rolling Mills and General Offices:* PITTSBURGH, PENNA.**

Hussey Warehouses carry stocks of Copper and Brass Products for prompt shipment.

PROMOTE EXTRA PROFITS NOW...
From Your Oil Heater Customer List

Add Thermostatic Temperature Control with this A-P HEAT REGULATOR Set

(ILLUSTRATED)
A-P MODEL 240-ED
Heat Regulator Set . . . Fits all oil heaters equipped with A-P Model 240-DR UR or YR Manual Controls.

Most new oil heaters, as well as heaters sold since 1939, can be easily equipped with this modern fuel-saving convenience! That means extra sales and profits for you on today's heaters as well as a new source of income from your old customer-list. And you'll make new friends with every sale, for every home will appreciate the savings in oil, time, effort, and the uniform, healthful room temperatures possible at the mere setting of a *Thermostatic Dial.*

This A-P Heat Regulator Set is easy to install on any Vaporizing Burner Oil Heater now using the A-P 240-DR, UR, or YR Constant Level Oil Control. The "Sales Package" is complete, including an Electric Conversion Top which mounts on present manual control, an accurate Wall Thermostat, a Transformer, and all accessories for quick and easy installation.

Make these extra Winter Profits NOW! Write for prices, samples and selling material.

(Be sure your new Heater Lines use A-P DEPENDABLE Oil Controls — for faster sales, greater customer satisfaction.)

AUTOMATIC PRODUCTS COMPANY
2452 NORTH THIRTY-SECOND STREET, MILWAUKEE 10, WISCONSIN

DEPENDABLE *Oil Controls*

DESIGNED TO ELIMINATE SERVICING

EXCLUSIVE VACUUM-DRAFT

Norge-Heat's oil-burning winter air-conditioners are the only furnaces with this sensational Vacuum-Draft—the invention that *pulls* air through the combustion chamber to give these new advantages:

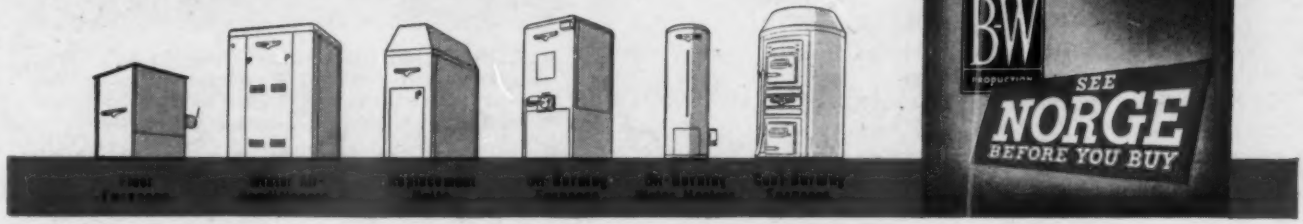
No oil fumes can enter the circulation system, because the pressure in the combustion chamber is always lower than that in the house. Combined with other Norge-Heat advancements, this Vacuum-Draft stops all "cold 70's" and "over-ride" . . . gives instant response to the thermostat . . . prevents loss of heat up the stack in the off-cycle . . . cuts installation costs . . . cuts service costs . . . delivers more even heat . . . assures greater reliability—and all at record-breaking low cost.

Such news-making improvements warrant investigation. Just write—

CONTROLLED • COMBUSTION

Norge Heat

Division of Borg-Warner Corporation • 574 East Woodbridge St., Detroit 26, Michigan



ENGINEERING B-W PRODUCTION

SEE NORGE BEFORE YOU BUY

TESTED

....every single one of them....

Too often float valves are simply assembled and shipped. As they say in the business, "The manufacturer doesn't even get 'em wet!" But that is emphatically not true of the McDonnell float valve for humidifier pans. Every single one is given an exhaustive test as illustrated here. Its feeding action is tested; its ability to close tight against water pressure up to 150 lbs. is tested.

Important though it is, this thorough, individual testing is simply the final step in turning out a valve that marks the difference between just a float valve and a real water level control. In the McDonnell Humidifier Valve you have a valve designed to cope with the heat, scale, mud and silt found in humidifier pans. The McDonnell "snap action" does the trick. When the float drops ¼ inch, a cam mechanism snaps the valve wide open. This flushes the valve and orifice clean. Contrast this with the sluggish, dribbling action of the ordinary slow-cracking float valve.

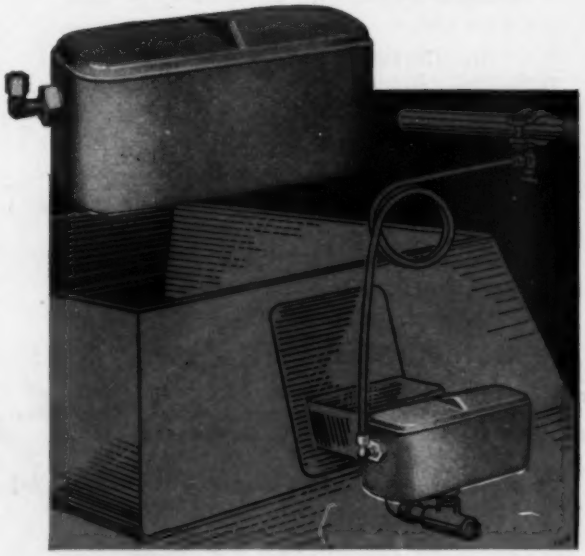
In this control you also have a valve that will seal tight against city pressure up to 150 lbs. No reducing valve is ever needed as with conventional types. The same mechanism that snaps it wide open, closes it with the same snap to a real, water-tight seal.

Although this valve has been better from the start we have never stopped improving it. It now has, as standard equipment, a special monel strainer mounted in a special, machined compression elbow. Experience with thousands of these valves during the war showed the way to further refinements in construction. In this snap-action valve you have a real water level control for any type of furnace, and it is now available on a reasonably prompt delivery schedule.

McDONNELL & MILLER, INC.
1318 Wrigley Bldg., Chicago 11, Ill.

Doing One Thing Well
REG. U. S. PAT. OFF.

McDONNELL NO. 417 Snap Action Valve for installation in existing pan, or float chamber, or for use by furnace manufacturers as original equipment.



McDONNELL NO. 517 consists of the No. 417 Valve, illustrated above, installed in substantial die-cast float chamber with matching cover, complete with strainer and compression fitting. (Tubing is not included.)

McDONNELL *Snap Action* FLOAT VALVE

RECOGNIZED BY REPUTATION...

WEIRTON

WEIRZINC Electrolytic Zinc-Coated Sheets and Strip · WEIRALEAD Lead Alloy-Coated Sheets · Long Ternes

WEIRITE Hot-Dip and Electrolytic Tin Plate, Tin Mill Black Plate and Special Coated Manufacturing Ternes

WEIRCOLOY Copper-Bearing Galvanized Sheets and Roofing Products · Lacquered and Coated Products · Structurals

N-A-X Low-Alloy Steels · Cold-Rolled Spring Steel · Cold-Rolled Sheets and Strip · Hot-Rolled Strip

WEIRTON STEEL COMPANY

WEIRTON STEEL CO.

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Division of NATIONAL STEEL CORPORATION

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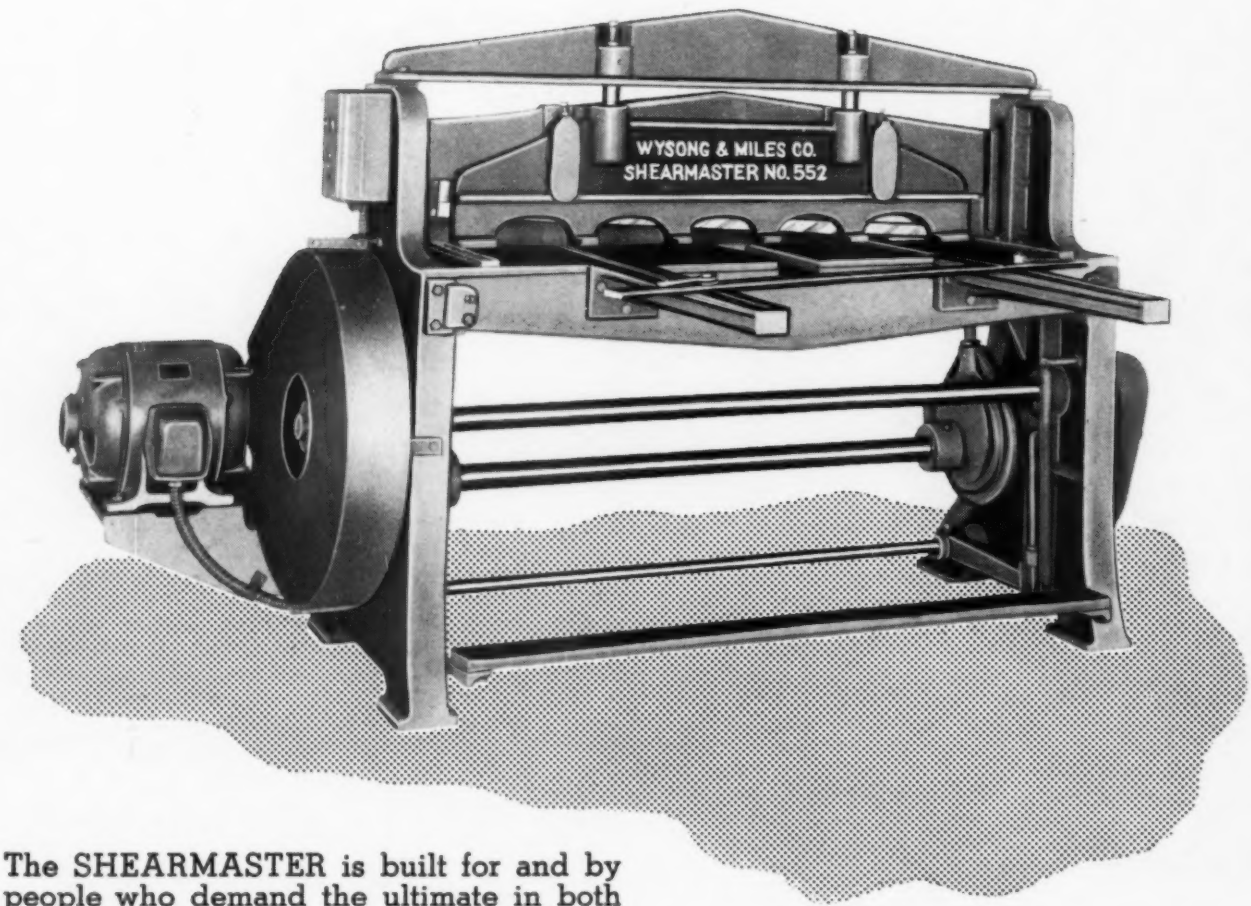
FASTER
MORE ACCURATE SHEARING



The SHEARMASTER is built for and by people who demand the ultimate in both production and accuracy. Rigid, massive construction eliminates waste caused by twist, spring and deflection. Note the streamlined, semi-steel cross-member above the bar for upper blade. Convenient heighth of graduated table serves to increase efficiency of operator. Gauges, both front and rear, are accurate and quick acting. Marring of sheets is prevented by broad clamping surface of positive hold-down. Clutch is sure and trouble free.

Increase shearing production in your plant with the SHEARMASTER; made in two heavy duty sizes, No. 552-52" and No. 572-72"... 14 gauge capacity. Jigs and fixtures used in drilling and machining of all parts . . . another highly desirable feature of WYSONG and MILES Machines.

Write for detailed information.

WYSONG and MILES Co

GREENSBORO, NORTH CAROLINA

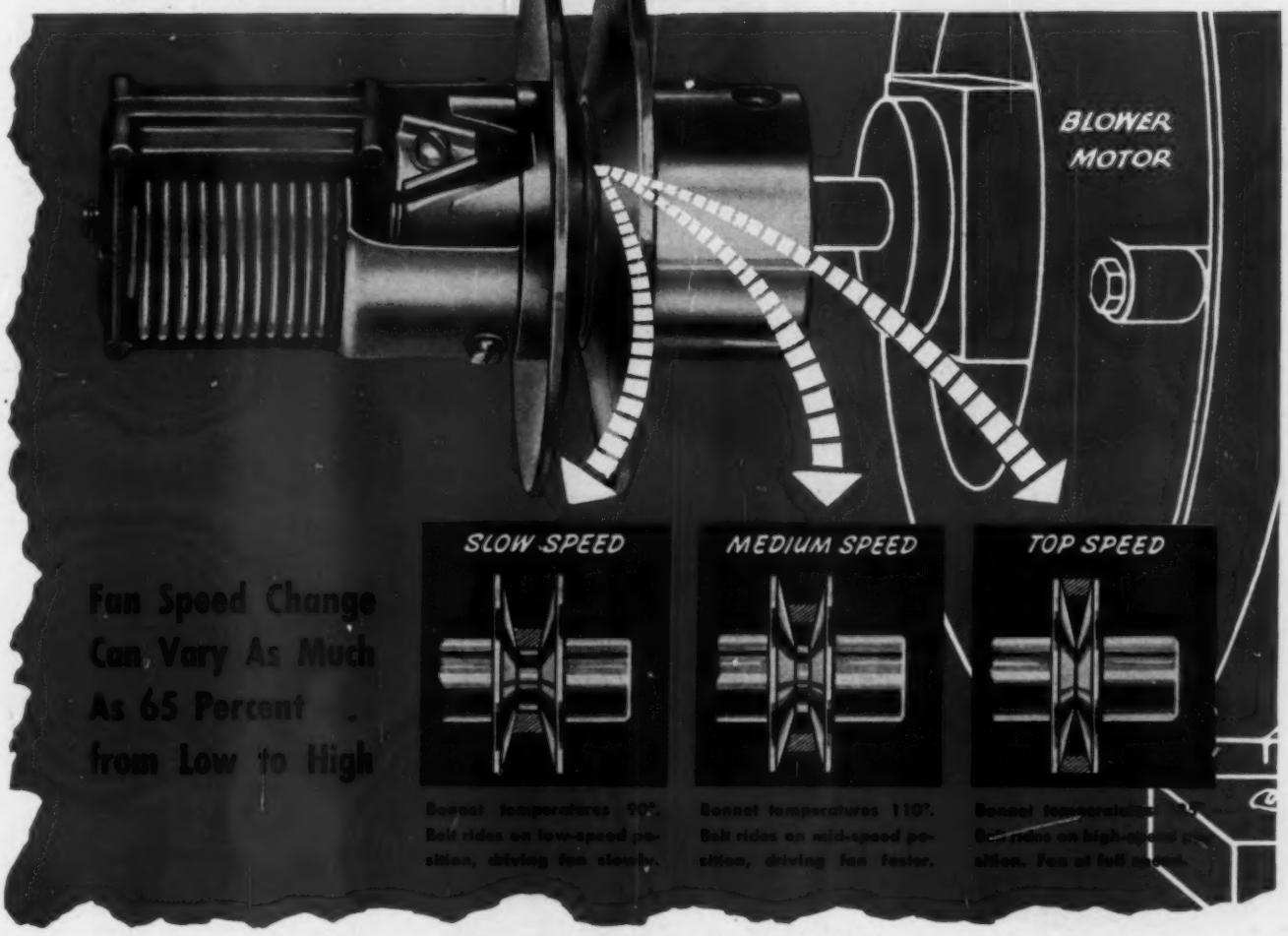
DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

WEBSTER ELECTRIC

THE NEW WEBSTER ELECTRIC Thermodrive

for Control of Warm Air Flow

is an Advance Step in Warm Air Heating!


BLOWER MOTOR
SLOW SPEED
MEDIUM SPEED
TOP SPEED
Fan Speed Change Can Vary As Much As 65 Percent from Low to High
Bonnet temperatures 90°. Belt rides on low-speed position, driving fan slowly.
Bonnet temperatures 110°. Belt rides on mid-speed position, driving fan faster.

Thermodrive offers both improvement for new equipment and a large conversion market.

Manufacturers will find by including Thermodrive they will improve their product and add a new important selling feature.

Those dealers selling to home owners will find that every present owner of a warm air heating system is a definite prospect for the added comfort provided by Thermodrive—this is an important, profitable market.

Thermodrive is designed to regulate warm air flow through control of fan speed in a forced warm air heating system so as to give more even room temperatures, along with more economical heating performance.

It is attached to the blower motor in place of the usual fixed pulley. A sample of warm air is continuously taken from the bonnet and discharged over a thermostatic bellows, which in turn actuates a sliding sheave, as shown above. This changes the pulley's effective diameter and results in varying the rate of warm air flow, in accordance with bonnet temperatures.

Be sure to secure the complete story on this new equipment. Write Webster Electric Company, Racine, Wisconsin.

WEBSTER ELECTRIC

RACINE WISCONSIN

Established 1909

Export Dept. 13 E. 40th Street, New York (16), N. Y. Cable Address "ARLAB" New York City

"WHERE QUALITY IS A RESPONSIBILITY AND FAIR DEALING AN OBLIGATION"

A Symbol of Heating Progress

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

● For more than thirty years the name RYBOLT has stood for better heating efficiency, economy and dependability. It has stood for progress in the industry because RYBOLT has pioneered in developments that kept pace with ever changing requirements.

The RYBOLT trade mark is the symbol of that progress in the past. It will continue to represent that progress in the future, because RYBOLT engineers keep abreast of new trends and are constantly doing practical research and experiment to improve the product. New designs and new features are adopted as fast as they prove practical and sound. Today's RYBOLT line will be a better line for you to handle—more profitable for you to sell and more satisfactory for the consumer to buy. The RYBOLT trade mark is our pledge of heating and air conditioning service that will measure up to the highest standard.

rh

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

Cold weather calls for *QUICK* INSTALLATION!

With cold weather at hand, there's no time left to delay new installations or repairs. C&L Lamneck furnace pipe and fittings are ready to go *now* — no fuss, no bother — and no compromise with quality. C&L pipe and fittings permit more installations per week because they are prefabricated at the factory for accurate fit.

As steel supplies improve, your jobber, who is doing the best he can, will speed up deliveries. Write for your copy of the C&L Lamneck Simplified Catalog.

Other C&L Products

C&L Blow Torches, Fire Pots
C&L Hoffman Water Heaters
Monarch Builders Finish Hardware, Panic Exit Devices
Buckeye Grain Bins, Corn Cribs
Silver Shield Silos

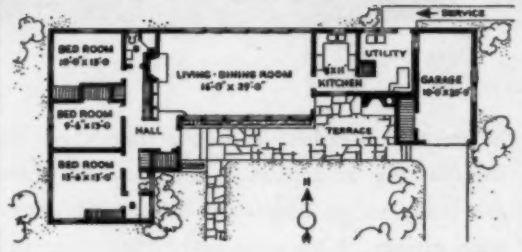
C&L Specify *Lamneck* FURNACE PIPE AND FITTINGS

CLAYTON & LAMBERT MFG. CO.

Sales Office: LOUISVILLE 10, KY. • *Factory:* MIDDLETOWN, OHIO

First home

NEARS COMPLETION IN THE CHICAGO TRIBUNE'S PRIZE HOME BUILDING PROGRAM



Suitable for a 50-foot lot, this home for a navy veteran and his family was adapted from a design by Lt. W. R. Burns, Jr., of Harrisburg, Pennsylvania.

Veteran's home features ceiling radiation heating system using Bryant Model 26 Boiler

Near completion in suburban Chicago is this attractive ranch style house, the first of 22 new Metropolitan Chicago homes being constructed in the Tribune's Prize Homes Building Program. Like all others in the Program, the house will be owned by a veteran and is being built from a design which won an award in the Tribune's recent Chicagoland Prize Homes Competition.

Featured in this house is a comparatively new radiant heating method in which the pipes and radiant coils are embedded in the ceilings. Walls and ceilings are insulated with rock wool as part of the heating arrangement. Heat source for the system is a Bryant Model 5-W-26 Boiler, with an output of 90,000 btu per hour.

The Bryant Model 26 Boiler, long a favorite in the nation's home radiation heating systems, is made in ten sizes to provide for a wide range of hot water or steam applications. Bryant Heater Company, 17825 St. Clair Avenue, Cleveland 10, Ohio. *One of the Dresser Industries.*

bryant
GAS
HEATING

LET THE PUP BE FURNACE MAN

Operating 'round the clock, day and night, the Perfex Tireless Twins are silent dependable servants that maintain temperature, regulate flames and safeguard heating plants . . . taking complete charge of the heating job.

The *tireless twins* make Automatic Heating *effortless*

Automatic heating is the only modern home equipment that provides complete freedom from physical effort . . . automatic dish washers require sorting and stacking . . . vacuum cleaners, pushing and pulling, etc. With the Tireless Twins, you can sell automatic heating to your prospects as the only modern home equipment that is *completely, effortlessly automatic.*

PERFEX

TWIN CONTACT CONTROLS

Twin Contact Controls are the nerve center of all better heating systems. Their superior quality is an important reason why leading manufacturers of automatic heating carefully pre-select Twin Contact Controls to bear their trade mark names.

ANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES
F LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

PERFEX CORPORATION, MILWAUKEE 7, WIS., Perfex Controls Ltd. Toronto 1, Ont.

FFORTLESS AUTOMATIC HEAT DOES THE JOB COMPLETE

Char-Gale FEATHER-LIGHT ALUMINUM FITTINGS

A NEW PRODUCT IN STEP WITH MODERN TRENDS

...and it costs no more!

Char-Gale all-aluminum fittings come pre-finished. Their surface needs no paint. Rust-resistant, they stay new. Install them today, and for years to come your work will speak well of you.

A furnace is only as good as its installation. Char-Gale fittings give furnaces a high degree of efficiency.

Char-Gale fittings are easier to install. Aluminum lightness means lower freight costs, quicker assembly time, more jobs finished with less effort. And they don't cost any more than fittings of other materials.

Come over to the modern side; ask your jobber about Char-Gale aluminum fittings.

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

CHAR-GALE

MINNEAPOLIS, MINNESOTA **CHAR-GALE MFG. CO.** **OMAHA, NEBRASKA**

BE FIRST IN SALES WITH

FRONT RANK

FIRST for Quality...

FIRST for Completeness...

FIRST for Service

THE

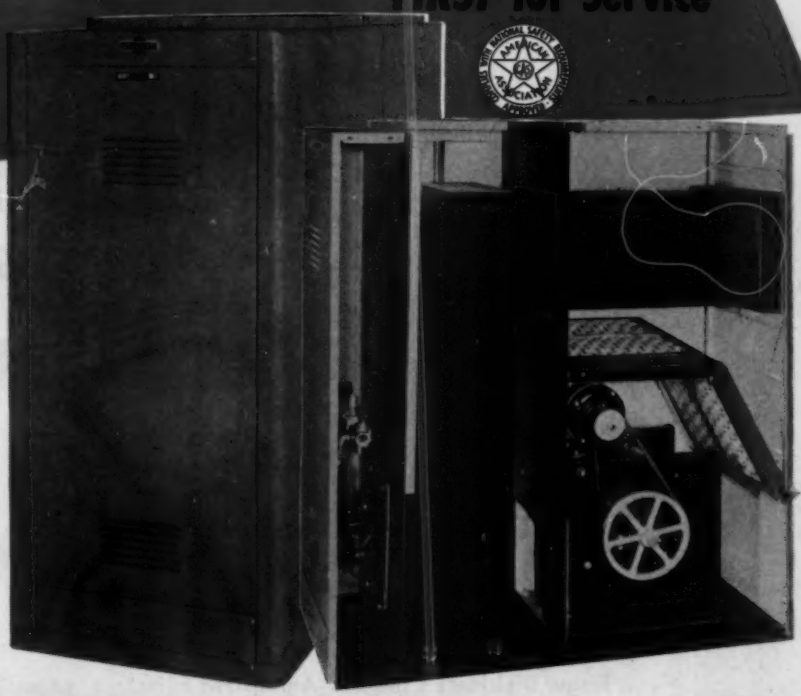
"MISSING LINK"

IS NOW ADDED

GAS FIRED LOW-COST WARM AIR CONDITIONER

Specially designed for heating with gas—the multiple jet type Burner being an integral part of the furnace—this Unit out-matches any similar type furnace in performance, lower first cost and heating efficiency. It is compact, rugged, fully automatic, and enhances any basement. It is the gas fire Unit to handle for sales and prestige.

Tested and Approved by American Gas Association

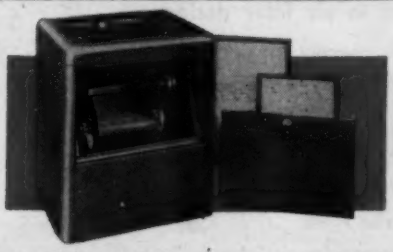


FRONT RANK — ALWAYS OUT FRONT!...THE LINE FOR BIGGER PROFITS!

MEMBER INDOOR COMFORT

A FRONT RANK Winter Air Conditioning Unit forces a generous supply of clean, healthful warm air to every corner of the house—including those "hard to heat" rooms. Has a proven record of economical and trouble-free operation. Builds customer satisfaction and increased sales for you.

● NOTE: *The Famous FRONT RANK Steel Gravity Furnaces Also Available*



Designed for circulating cleansed air throughout the house, this FRONT RANK Blower-Filter Unit is adaptable to any type furnace—old or new. Compact, efficient, beautiful. A topnotch sales builder.

You can't beat a FRONT RANK Stoker—from any angle. Burns low price coal, gives more heat from less fuel, full automatic with a Hopper that is 'triple sealed' preventing escapage of fumes or smoke. It fits any type furnace or boiler. Builds not only sales but satisfied customers.

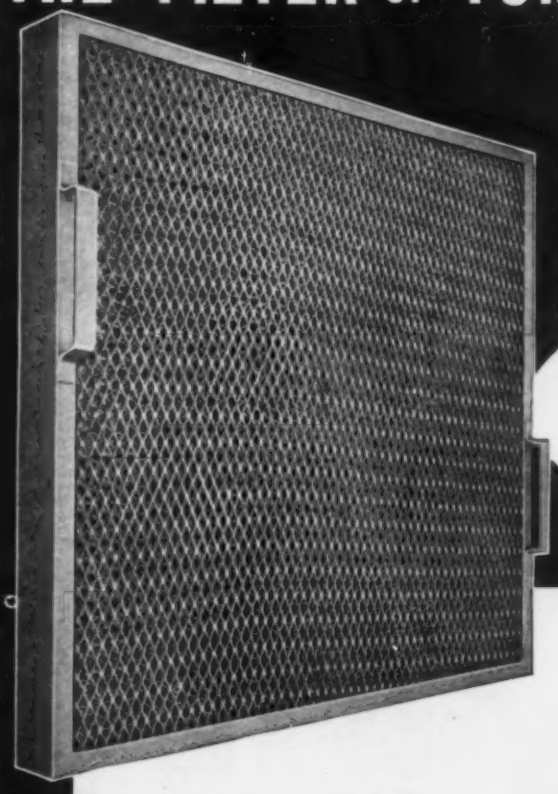
The FRONT RANK Oil Burning Unit is compactly designed for adaptability and beauty, providing automatic oil heat with winter air conditioning. It is of the same high quality in engineering and heating efficiency as all Units that comprise the FRONT RANK Line. Investigate.

● *Be FIRST with FRONT RANK—It's The Line With The FIRSTS!*

2500 Ohio Ave. **FRONT RANK FURNACE CO.** St. Louis 4, Mo.

AGITAIR ANNOUNCES

THE FILTER OF TOMORROW—*Today!*



HIGH VELOCITY

AGITAIR FM

with exclusive

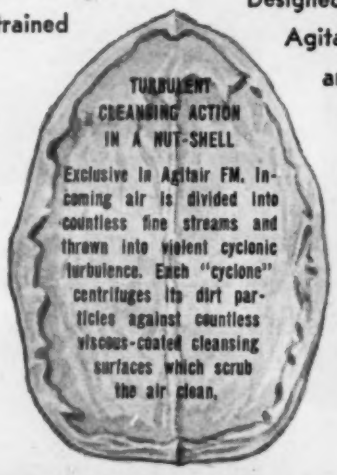
TURBULENT CLEANSING ACTION

with greater efficiency

Agitair FM Filters 50% More Air At The High Velocity of 432 F.P.M.

Here's greater efficiency . . . lower resistance . . . longer life! Here's the new Agitair FM Filter with exclusive Turbulent Cleansing Action! This remarkable improvement in air filter design gives you air that's not merely strained but virtually scrubbed.

Agitair FM filters 50% more air at the higher velocity of 432 F.P.M. Two (2) FM's do the work of 3 ordinary filters . . . 33% reduction in space . . . fewer units to be installed . . . reduced servicing. This, coupled with higher dust holding capacity and rugged all metal construction makes it possible for Agitair FM to deliver unparalleled all-around filter efficiency.

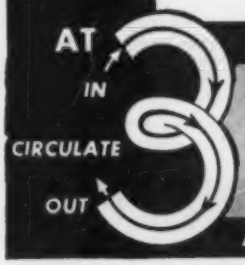

TURBULENT CLEANSING ACTION IN A NUT-SHELL
Exclusive in Agitair FM. Incoming air is divided into countless fine streams and thrown into violent cyclonic turbulence. Each "cyclone" centrifuges its dirt particles against countless viscous-coated cleansing surfaces which scrub the air clean.

Designed for easy cleaning and servicing, Agitair FM can be removed, cleaned and restored to top efficiency "in a flash."

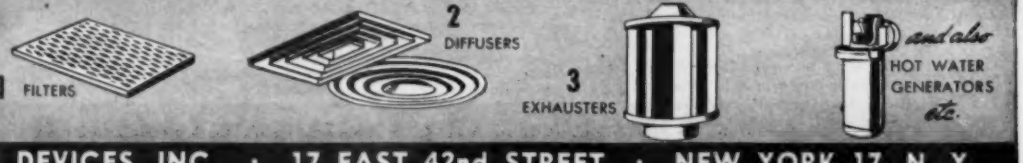
When you specify filters remember: *Agitair FM removes more dirt from more air in less time.*

SEND FOR VALUABLE BULLETIN FM

8 Pages Chock Full of data on the new Agitair FM Filter. Here's "proof-positive" of Agitair FM superiority.



KEY POINTS IN AIR CONDITIONING—AGITAIR SERVES BEST



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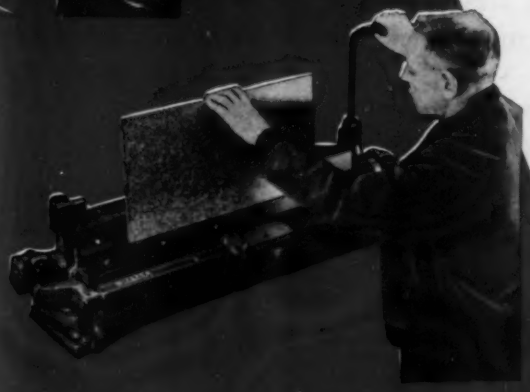

NIAGARA MACHINE AND TOOL WORKS

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District Offices:

CLEVELAND • DETROIT • NEW YORK

Ever since 30 years before Broadway turned on its first electric light...

THATCHER FURNACES HAVE BEEN DELIVERING THE GOODS

THE Great White Way was a gas-lit street till 1880, when the first electric light went on. But hundreds of American homes had long since known the efficiency and comfort delivered by Thatcher Furnaces.

For 30 years before that — and 66 years since — the Thatcher reputation has kept growing. Now we're looking ahead to bigger, more efficient production in our new furnace plant — to finer and finer Furnaces, Boilers and Air Conditioners for your customers' satisfaction.

Today, as always since 1850, we welcome a chance to help you with *your* problems. All our 96 years of heating know-how is at your disposal to help you give your customers more for their money than ever.

KEEP YOUR EYE ON THATCHER

Thatcher **FURNACE COMPANY**

Garwood, New Jersey

SPECIALISTS IN HEATING SINCE 1850

These hot air ovens for use in chemical laboratories represent but one of hundreds of profit-making opportunities for sheet metal men who work ENDURO Stainless Steel.

when you're working stainless steel

An important point to remember, in deciding whether or not you are going to work stainless steel, is that stainless steel jobs are profitable jobs.

And when you're working Republic ENDURO Stainless Steel, you need not have any worries about troublesome fabricating difficulties. Once you have tried ENDURO, you will see that stainless steel jobs, in practically all cases, flow through your shop smoothly and efficiently on the same equipment which you use for working ordinary carbon steel analyses.

Republic—world's largest producer of alloy and stainless steels—has the answers to your questions about fabricating and welding procedures, too. They're contained in the two informative books, *The Fabrication of Republic ENDURO Stainless Steel* and *The Welding of Republic ENDURO Stainless Steel.* If you do not already have copies of these books, write for them today—they're FREE.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic
ENDURO STAINLESS STEEL
Reg. U. S. Pat. Off.

Other Republic Products include Black, Ga[illegible]

Lau Blower mass production methods CANNOT BE MET by small-quantity assemblers

There are many positive advantages—the ultimate one being *exact, known costs*—in buying blowers completely assembled, packaged, ready to put on the line. It may seem a simple matter to buy wheels and then build housings for them. But it isn't so simple—your problems are innumerable, and your costs questionable. Besides, the combination may not be exactly right for efficient air delivery performance.

Lau has an investment of thousands of dollars in engineering and equipment to say nothing of years of testing and research in order to produce standardized blowers with precision-matched wheels and housings for best possible performance. Performance is a known quantity. Costs are known. Mass production facilities of this largest manufacturer of furnace blowers make it possible for Lau to offer you unmatched low prices for complete blower assemblies. If you've been thinking about building your own blowers, get all the facts first. Write.

IN THE COMPLETE ASSEMBLY, COST OF ALL THESE PARTS MUST BE CONSIDERED

- Wheel
- Shaft
- Bearings
- Collars
- Washers
- Nuts
- Bolts
- Bearing Support
- Blower Support
- Motor Mounting
- Cutoff
- Housing Sides
- Housing Back
- Blower Pulley
- Motor Pulley
- Belt

And, besides, there are labor, purchasing, warehousing, painting and stocking costs, material spoilage and waste, attendant merchandise losses, inventory costs, plant handling, and the cost of final assembly. If blower is not installed in the furnace before shipment there are additional, expensive packaging costs.

THE LAU BLOWER COMPANY
DAYTON 7, OHIO, U. S. A.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

CHRYSLER AIRTEMP

DIVISION OF CHRYSLER CORPORATION

Leadership Based on Quality Products

Constant product research and advancements, outstanding laboratory staffs and facilities, Chrysler Corporation engineering and quantity production skill—all bring a high degree of dependability and public acceptance to Chrysler Airtemp products. In three important fields—heating, air conditioning, and commercial refrigeration—the name Chrysler Airtemp is the buyer's assurance of quality design and outstanding performance. There's a dealer agreement for 1, 2 or all 3 Chrysler Airtemp lines. For full information about this opportunity, write Airtemp Division of Chrysler Corporation, Dayton 1, Ohio; in Canada—Therm-O-Rite Products, Ltd., Toronto, Ontario.

Automatically Yours

CHRYSLER AIRTEMP

HEATING • AIR CONDITIONING
COMMERCIAL REFRIGERATION

© 1947 Chrysler Corporation

The Refrigeration Equipment Manufacturers Association estimates that air conditioning can be included in new apartment building projects at a cost to the tenant of $1.27 per month per room.

Based on air conditioning requirements in a temperate climate this estimate covers the cost of equipment, installation, operation plus a return on the investment.

With air conditioning in reach of the average-income tenant REMA predicts that apartment buildings without this convenience will become obsolete in 10 years.

This indicates a steadily increasing demand for air conditioning equipment and high quality ductwork. The proper installation of long lasting ductwork will depend largely on easy working rust-resisting steel sheets. Beth-Cu-Loy Galvanized Sheets have the qualities that sheet metal contractors know are important for air conditioning jobs. They are highly ductile, simple to form, cut and solder. They have a copper-bearing base with a uniform zinc coating that combine to give double rust-protection. With Beth-Cu-Loy Galvanized Sheets ductwork can be expected to last considerably longer than that made from ordinary steel sheets.

Bethlehem Steel Company, Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

★ BETHLEHEM STEEL ★

BETH-CU-LOY GALVANIZED SHEETS

when you sell FLUID HEAT!

4 Pressure Burners
Firing rates from 7/10 to 12 gallons per hour

7 Vertical Rotary Burners
Firing rates from 1/2 to 6 gallons per hour

3 Air Conditioning Furnaces
From 120,000 to 200,000 BTU per hour

6 Boiler Burner Units
Capacities from 475 to 840 sq. ft. of standing hot water

Fluid Heat has everything you need to sell more homeowners on oil heating . . . thus gives you *more* opportunities for lining up steady, lucrative fuel oil contracts. Here's why:

1. The Fluid Heat line is really complete . . . builds more sales by satisfying more customers . . . with a trademark that has won solid consumer acceptance by dependable performance since the beginning of oil heating.
2. The Fluid Heat line's engineering and construction is kept ahead of competition by a wide-awake development laboratory . . . headed by engineers long experienced in the industry.
3. You sell the Fluid Heat line under a friendly Dealer Franchise, which is mutually profitable. And remember, our stake is in oil heating . . . we'll go all out to help you compete with other types of heating.

Write today for full details on this profitable Fluid Heat Dealer Franchise. There's no cost . . . no obligation. Address: FLUID HEAT DIVISION, Anchor Post Products, Inc., 6720 Eastern Ave., Baltimore 24, Maryland.

fluid heat
PRODUCTS

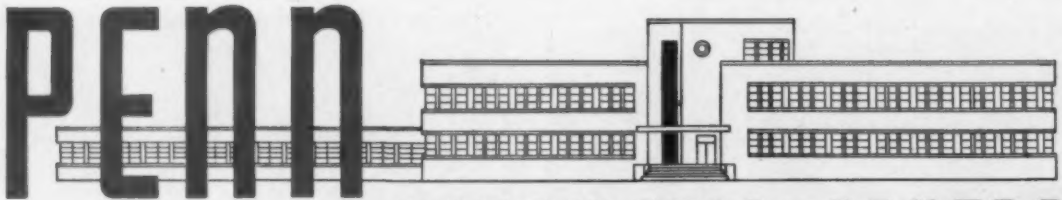
"WORLD'S ECONOMY CHAMPION"
Manufactured by the Anchor Post Products, Inc.
Baltimore, Md., Established 1892

THIS DEAL WINS

Satisfied Heating Customers

You know your customers will be satisfied . . . when you sell PENN Automatic Controls. Satisfied . . . because these better heating controls are "field-tested" to provide long life and accurate service.

With this complete line of automatic controls . . . you can specify a control for every type of heating job, every kind of system. There are primary controls, limit switches and relays. Then there is PENN Temtrol, the famous heat-anticipating thermostat, PENN Tem-Clock, with its economy and convenience of completely automatic Day-Nite Control. Ask your jobber about these dependable and efficient controls today. *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada Penn Controls, Ltd., Toronto, Ont.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

For quiet operation this blower installed in a hotel is driven by a Century ½ horsepower SC motor

Provide All the Comfort Your Equipment is Designed to Give—with Quiet Starting and Operating CENTURY MOTORS

Century air conditioning motors contribute greatly to the comfort of air circulating and air cooling installations.

Century motors' unusual freedom from vibration — and quiet starting and running are the result of careful electrical and mechanical balancing, accurately machined bearings, rigid motor construction, and cushioned bearing bumpers that reduce the shock often caused by V-belt irregularity.

Many air conditioning and refrigeration manufacturers have standardized on Century motors to assure their customers the greatest air conditioning comfort for the longest period of time.

Century builds a complete line of motors from 1/6 to 400 horsepower to give smooth, quiet, dependable operation on compressors, blowers, fans, pumps, unit heaters and any other heating, cooling or air conditioning installation. Specify Century motors on all your electrically powered equipment.

Century C MOTORS

CENTURY ELECTRIC COMPANY, 1806 Pine St., St. Louis 3, Mo.

482

Offices and Stock Points in Principal Cities

PLASTEEL AIR CONTROLS

A Startling NEW

Patents Applied For

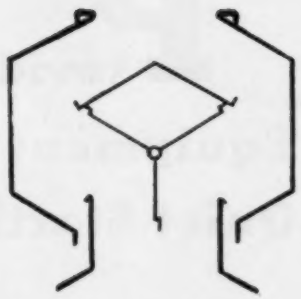
Continuous Roof Ventilator

HERE is a freshly designed continuous or ridge type ventilator that eliminates objectionable features and adds new highly desirable features to roof ventilation. It *gets the air out* of buildings quickly and efficiently under all weather conditions. It has no angle or bar braces, or other impediments to efficient exhaust flow. It can be installed on any type of roof in any length desired—always providing 100% exhaust opening per size. Note its *exclusive* features.

It is a ventilator you will be proud to recommend and install—that will bring you repeat business—not maintenance and repair calls. It is extremely easy to handle and economical to erect. Your customers will praise its performance. Furnished in sizes from 6" to 24" throat openings.

Plasteel Engineers will gladly assist you on any ventilation problem.

Write, Wire or Telephone for Complete Information Today



EXCLUSIVE FEATURES

- 100% exhaust opening per size of ventilator. 100 feet of 12-inch Air Control provides *100 sq. feet of clear exhaust opening*—not impeded by any structural members. Other sizes proportionately.
- Y Damper provides *free flow exhaust*. Thus highest efficiency is maintained.
- Drainage gutters guide rain to *ends of units* where it is drained onto the roof. Water *does not pour over sides of ridge caps* and impede building exhaust during rain storms.
- No interior angle or bar bracing is used. Greater strength and rigidity are obtained and nothing impedes the exhaust flow.
- Individual units are 8 feet long. Entirely self contained. Can be used singly or continuous in any length desired.

A Few Choice Territories Are Still Open for Representation

PLASTEEL ROOFING · PLASTEEL AIR CONTROL

PROTECTED STEEL PRODUCTS

General Office and Plant • Washington, Pennsylvania

HESS

A Famous Name in Home Heating Since 1873

On the Square
RADIANT HEATING

NEWSPAPER!
MAGAZINE!
DIRECT MAIL!
RADIO!

ADVERTISING

will bring greater profits to HESS Dealers

HESS WARMING & VENTILATING CO.
1211 So. Western Ave.
Chicago 8, Ill.

Dept. C

Yes- Send me complete details on the HESS WELDED STEEL FURNACE.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

HESS
Since 1873

WARMING & VENTILATING CO.
1211 So. Western Ave., Chicago 8, Ill.

A QUICK END TO FIREPOT TROUBLE because

FIRELINE

repairs cracked firepots without delay —without new castings

Here is a furnace firepot lined with Fireline. The fire bakes this refractory material into a solid, durable, monolithic lining. Saves castings, labor,fuel—withstands heat to 3000 deg. F.

With Fireline you don't need new castings for repairing cracked firepots. You can hit those rush-calls in high, finish the job in hours, speed on to the next job. With a drum of Fireline on the truck you can stretch available man power hours. And because every Fireline job is a speed job, the profit percentage is higher for you.

Fireline is packed in 100-lb. drums. Also in 50-lbs. pails for lining heating stoves, circulating heaters, etc.; and in 5- and 10-lb. cans for repairing cook stoves, hot water heaters, etc.

WHAT IS FIRELINE?

Fireline is a high-quality refractory moulding material in moist, plastic form which is installed as a complete lining entirely around the firepot. The fire bakes it into a durable, one-piece lining which withstands temperatures up to 3000 deg. F.—hotter than any dometic furnace can attain.

WHAT DOES FIRELINE DO?

Fireline repairs cracked and burned-out firepots—without new castings—without dismantling the furnace. Fireline seals the castings gas-tight. It prevents the escape of gas, odors, and soot into the building. It produces a hotter fire because it radiates and reflects heat across the entire fuel bed which means better combustion.

HOW IS FIRELINE INSTALLED?

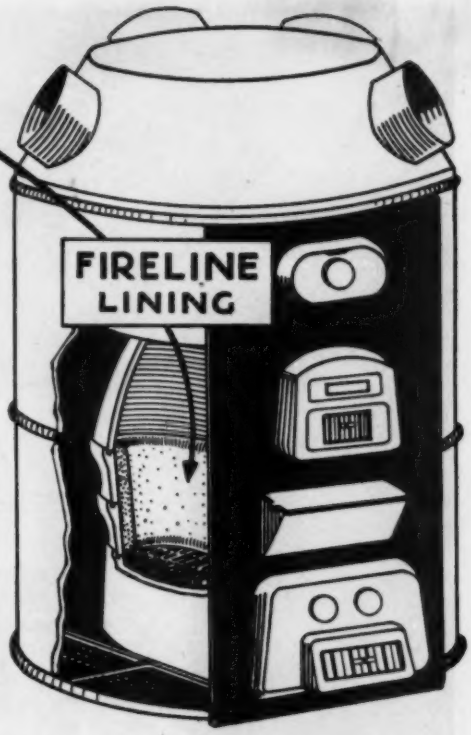
Fireline is installed through the furnace door, easily and quickly. Just pound it into place with a hammer and trim it smooth. That's all there is to it. Fireline is ready to use—nothing to mix—nothing to add.

EVERY FURNACE NEEDS FIRELINE!

Even furnaces in good condition need Fireline because it protects good firepot castings and effects fuel savings. For steel furnaces, it can be moulded to any shape to replace or patch the refractory tile.

Fireline is stocked by leading jobbers everywhere. Ask your jobber for prices and discounts on Fireline heating specialties or write us for free bulletin and descriptive literature including tables to tell you quantities required for furnace jobs of various sizes.

Fireline is installed 1 to 1½ in. thick. The average 22 to 24 in. furnace requires 100 lbs. for a complete lining around the entire firepot. Also used to replace fire brick in steel furnaces.



Fireline products are available at leading jobbers everywhere. Write for bulletins, prices and discounts.

IRONSET FURNACE CEMENT

The high-quality cement for setting up new furnaces and re-cementing old ones. Withstands higher temperatures. Will not crack, bloat, shrink, or blister. Gives a high degree of permanence to your work. Try it on your next job and watch it produce other customers for you. Packed in 5- and 10-lb. cans.

FIRE-HEARTH CASTABLE

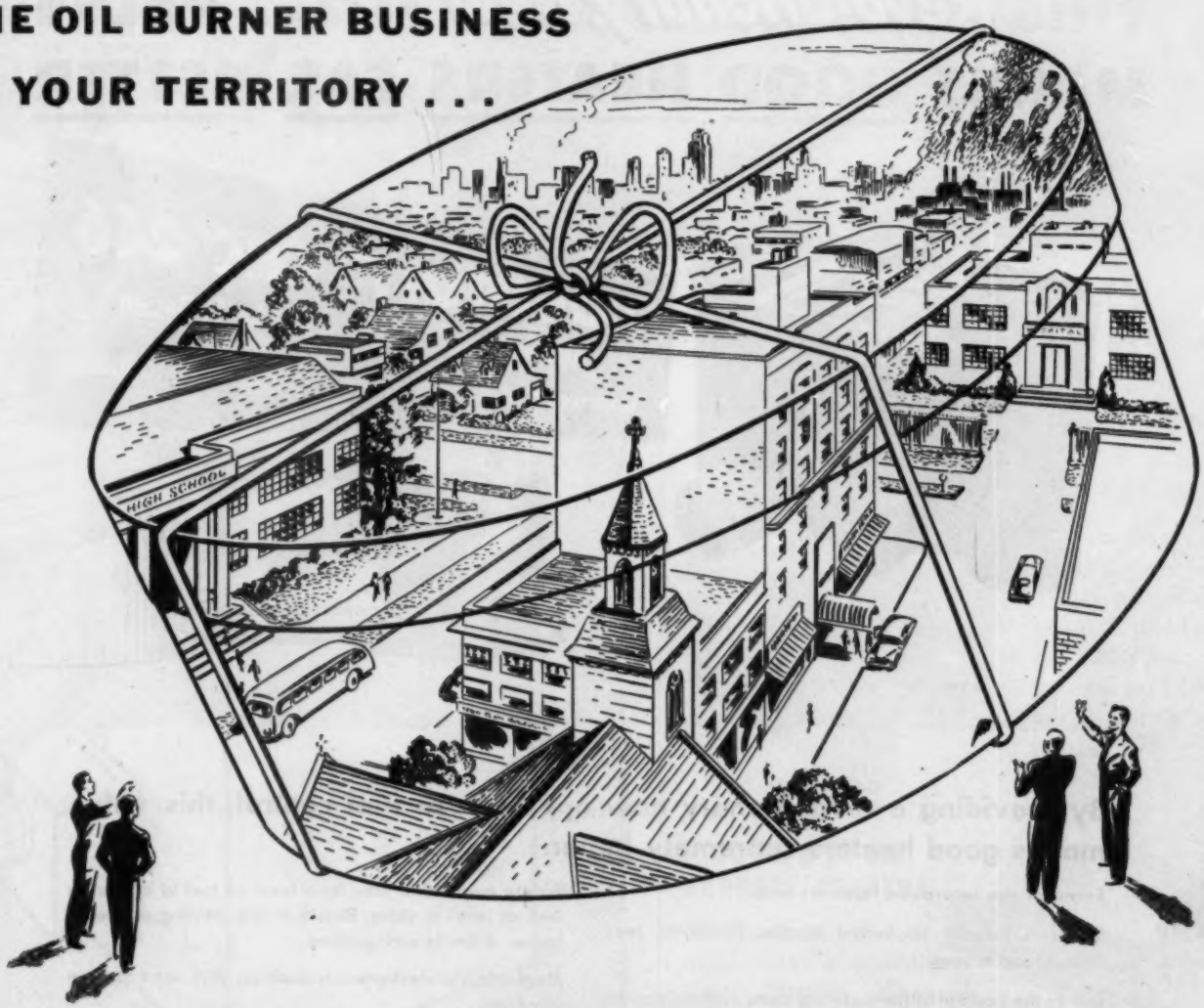
The ideal refractory for setting stokers, sealing tuyeres, and precast combustion chambers. Also for making furnace baffles. Easy to use: Just mix with water, pour into place, and smooth with a trowel. Sets without heat. Packed in 50- and 100-lb. bags.

FIRELINE STOVE & FURNACE LINING CO.

1816 Kingsbury St., (Dept. A), Chicago 14, Ill.

"WRAP UP" ALL

THE OIL BURNER BUSINESS IN YOUR TERRITORY . . .



WITH PETRO EQUIPMENT, you can go after EVERY oil heating job, from residences to apartments, from commercial establishments to industrial plants. For in the *complete* PETRO line, you'll find units to meet any oil firing need.

You can select pressure-atomizing models for from 1 to 18 gallons per hour of domestic fuels. For heavier duty, horizontal rotary cup models handle from 11 to 145 gallons per hour of heavy commercial oils. Whatever the model and size you choose, a PETRO is the product of nearly 45 years' specialization in oil heating . . . engineering skill . . . and experience.

PETRO burners, water heaters, and boiler-(or furnace-) burner units are distributed by established heating wholesalers. Write for the name of the supplier nearest you.

PETRO

REG. U. S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT SINCE 1903

PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT

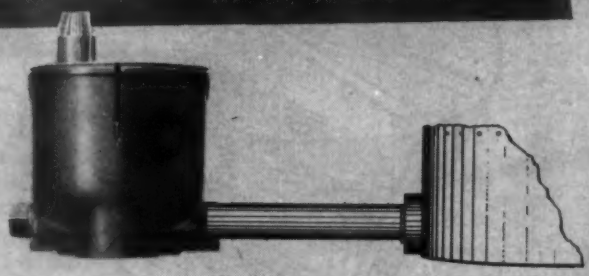
PETRO FUEL OIL BULK PLANTS, DISTRIBUTION TERMINALS AND FACILITIES IN: BOSTON • PROVIDENCE • STAMFORD MT. VERNON • NEW YORK • MINEOLA • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO

THIS *Revolutionary New* FLOAT VALVE MAKES GOOD HEATERS FAR BETTER

"DETROIT" CRC 246

Advanced in Principle • Simpler in Design

Improved in Appearance • Superior in Performance



By providing a revolutionary new approach to fuel control, this valve makes good heaters supremely better.

Some of the improved features are:

Connects directly to burner nipple. Eliminates tee, fittings, and tubing.

Due to the position of the metering stem, approximately in the center of the assembly, this valve can be tilted a reasonable amount without affecting fuel flow. Leveling by eye is satisfactory. This saves time at assembly and minimized field complaints.

Rate of flow to burner is constant with inlet heads varying from 2 inches to 84 inches. Permits placing bottom of tank flush with top of valve and assures maximum heater output as long as there is fuel in tank.

Makes possible design of heaters of less overall height or greater tank capacity. Eliminates "dying fire" when fuel supply is low.

Safety mechanism trips from level of fuel in burner as well as level in valve. Results in less pooling of fuel in burner if fire is extinguished.

Magnetic trip mechanism is positive. Will not trip from vibration.

Low flows are extremely accurate and consistent—a decided advantage for low pilots on water heaters and furnaces.

Fully temperature-compensated. Uniform fuel flow regardless of temperature assures full heater output at all times.

Smaller size—neat appearance—only two-thirds the size of present valves. Provides greater flexibility in heater design.

Simple to service. Few parts to handle—job takes only a few minutes.

DETROIT LUBRICATOR COMPANY *General Offices:* 5900 TRUMBULL AVENUE DETROIT 8, MICHIGAN

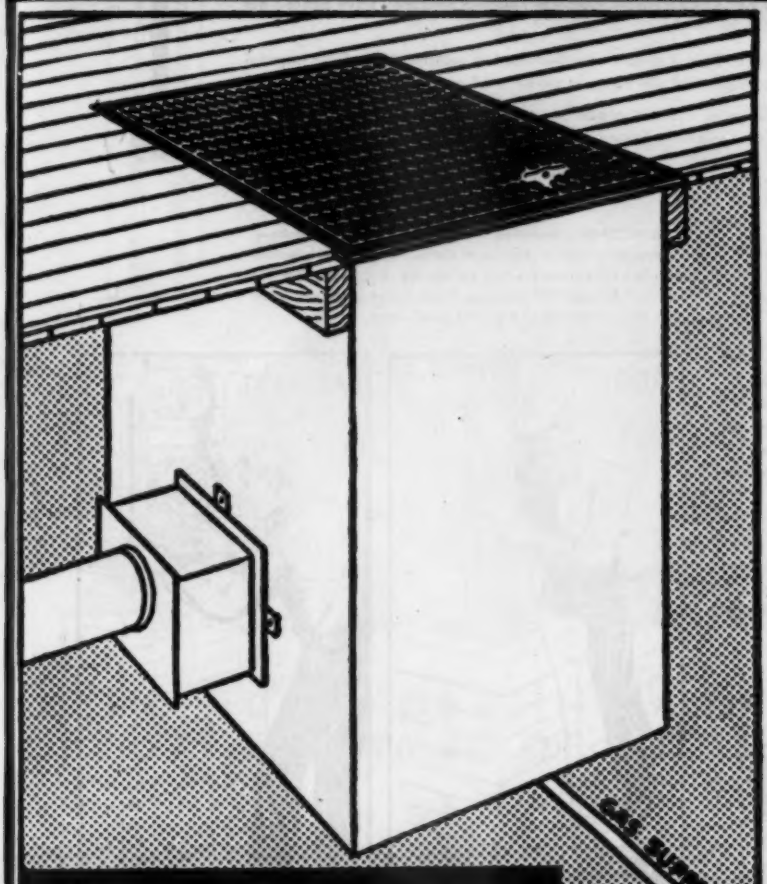
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DETROIT"

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

One Stop Burner Service



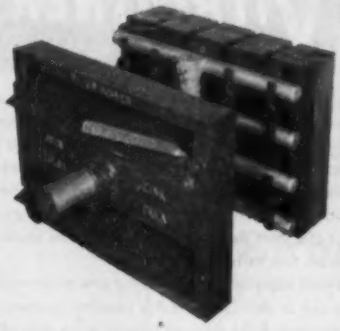
That Amazing JOHN ZINK FLOOR FURNACE

The floor furnace that features EFFICIENCY, QUIETNESS, DURABILITY, and ECONOMY. Due to better construction it doesn't pop or rattle when heating up or cooling off. It is easily installed and easily cleaned from the top. All four popular sizes are reasonably priced.

JOHN ZINK

Conversion Burners

SERIES "R" BURNER

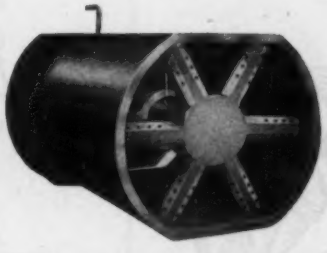


Refractory type gas burner—especially adapted for installing in boilers having very low draft and small combustion space.

SC-300 & SC-600 FURNACE BURNERS

For industrial as well as domestic use. Burns Natural Gas, Manufactured Gas and LP gas. Available for Vertical or Horizontal firing.

ZINK STAR BURNER



Low pressure, radiating armed spider gas burner. Turns down without blowing out—turns up without vibrating. Applicable to heating or power boilers. Wall type.

We also manufacture Gas Burners, Oil Burners and Combination Oil and Gas Burners for: Domestic Boilers, Heating Boilers, Industrial Boilers, Power Boilers and Unit Heaters. We are willing and capable of designing and manufacturing special burners for special purposes.

JOHN ZINK COMPANY

TULSA, OKLAHOMA — Los Angeles

NEW YORK, N. Y. — Houston

Safeguard and Protect MASONRY CHIMNEYS

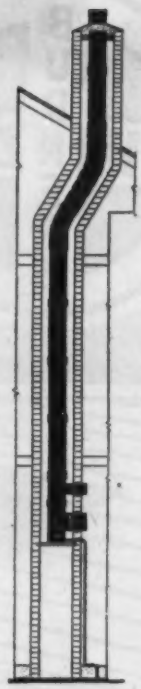
VITROLINER Chimney Liner, a pioneer in the field—with 18 years of engineering development and research, is successfully used in safeguarding and protecting masonry chimneys—assures long life and helps preserve the original beauty and strength of the chimney. VITROLINER functions as an inner flue and is a proven practical and durable Chimney Liner.

Increases chimney draft and stack temperature, thereby reducing condensation, as the dew point of the gases is seldom reached until they have passed out of the chimney.

VITROLINER Vent Pipe is specifically designed to withstand all of the harmful and destructive properties created by products of combustion.

Resists the effects of acids in condensation—will not rust, corrode or be affected by salt air conditions (along coast lines)—is dependable, uniform and has long life.

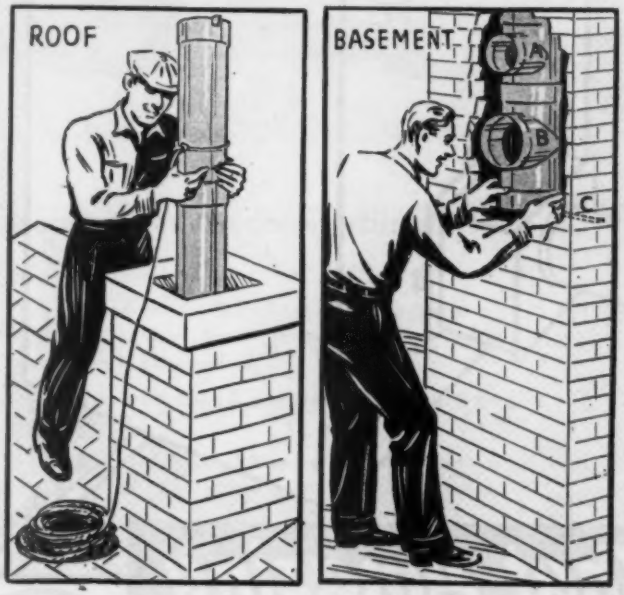
VITROLINER
-the Superior Vent Pipe
Trade Mark Registered



VITROLINER is lowered from the roof, as illustrated below, in straight or offset chimneys. The parts are loosely bolted and lowered from the top by means of a rope. The Tee drains "A" and "B" are supported on the cross angle rod "C" and connected to the vent pipe above.

VITROLINER Chimney Liner is heavy gauge, high quality enameling stock iron-coated inside and out with a ground coat and a second coat of special high temperature acid-resisting vitreous enamel. Each joint is welded and has the appearance of a seamless tube. The metal and acid-resisting vitreous enamel used in the manufacture of VITROLINER have the same co-efficient of expansion. Bell and Spigot type joint assures a uniform fit. The inside diameter is smooth and streamlined from top to bottom.

The many various shapes and sizes of VITROLINER parts make it easy to line any type of chimney. By the use of short lengths it is possible to line offset chimneys without breaking into the flue. Bolts through lugs at each end of each joint of VITROLINER hold the various lengths together. The top of the chimney is sealed up around the liner. The resulting dead air space prevents escape of heat—acts as an insulation, and increases chimney efficiency.



VITROLINER BREECHING PIPE

ELIMINATES THE EXPENSE AND BOTHER OF FREQUENT REPLACEMENT

VITROLINER is a new breeching pipe for connecting heating plant to chimney. VITROLINER BREECHING PIPE will give years of trouble-free service. A complete line of fittings makes any hookup possible and can be easily and quickly installed. VITROLINER eliminates the fire hazard of corroded pipe. VITROLINER is made of heavy gauge steel completely coated inside and outside with porcelain to prevent corrosion. VITROLINER'S procelain finish is attractive and adds to the beauty of any room.

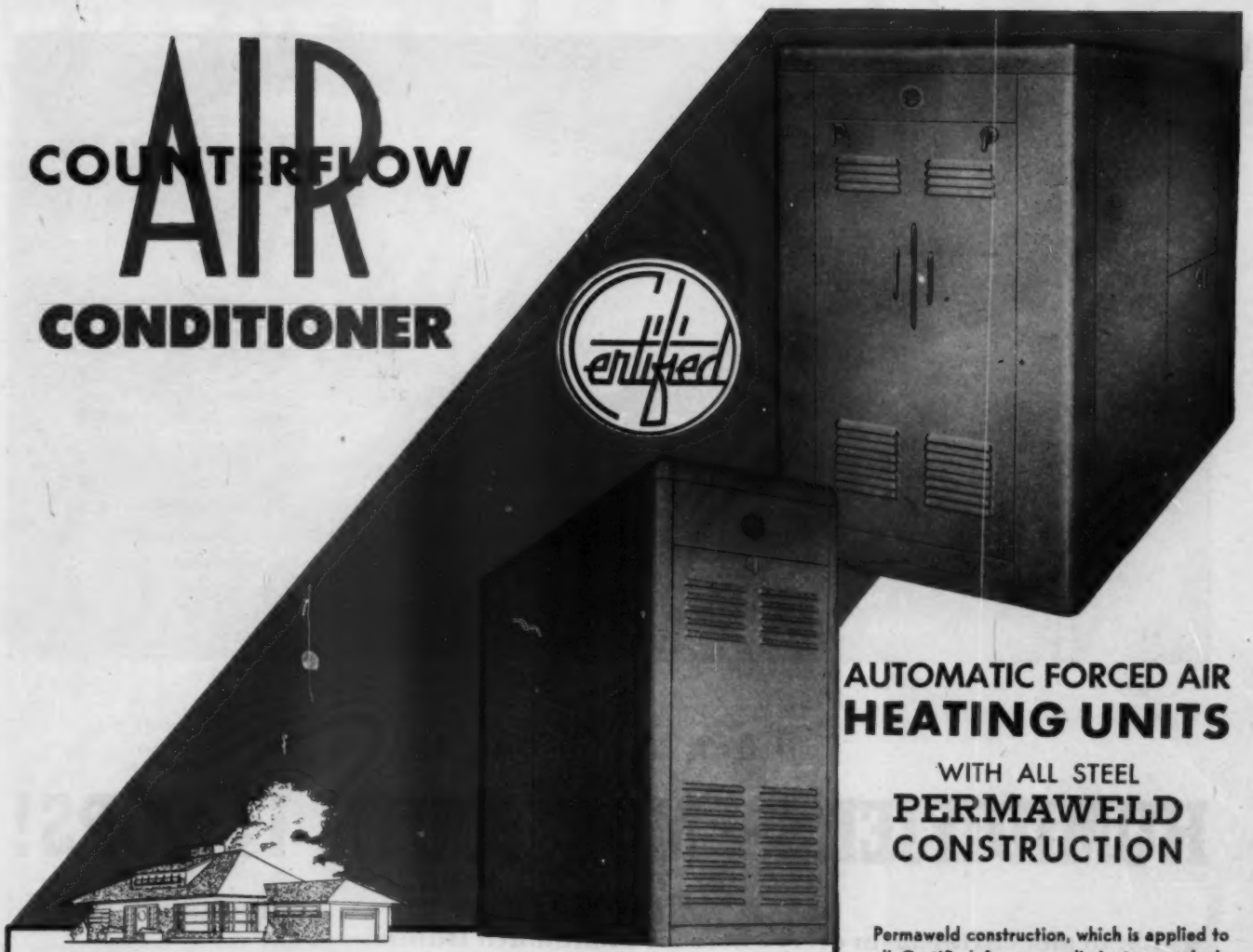
SPECIAL FEATURES: The telescope section is adjustable in length and is used to fill in any odd length now accommodated by standard lengths. The Vitroliner damper section has a cleanout hole covered with a sliding sleeve.

Write for further details and circular.

CONDENSATION ENGINEERING CORPORATION

122 So. Michigan Ave., Chicago 3, Ill.

COUNTERFLOW AIR CONDITIONER



AUTOMATIC FORCED AIR HEATING UNITS

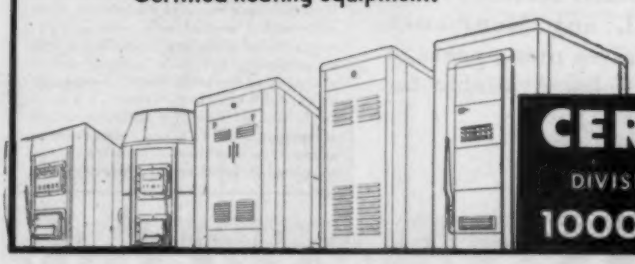
WITH ALL STEEL
PERMAWELD CONSTRUCTION

Permaweld construction, which is applied to all Certified furnaces, eliminates gas leakage. The entire double bodied furnace is electric arc welded into one solid piece. Furnace body is of heavy-gauge rolled steel with the welded seams even stronger than the steel itself. Through this method of construction, bolts and rivets, a principle cause of gas leakage is eliminated. Permaweld construction of an all steel furnace body eliminates the extra expense of periodical inspections and recementing of cast sections.

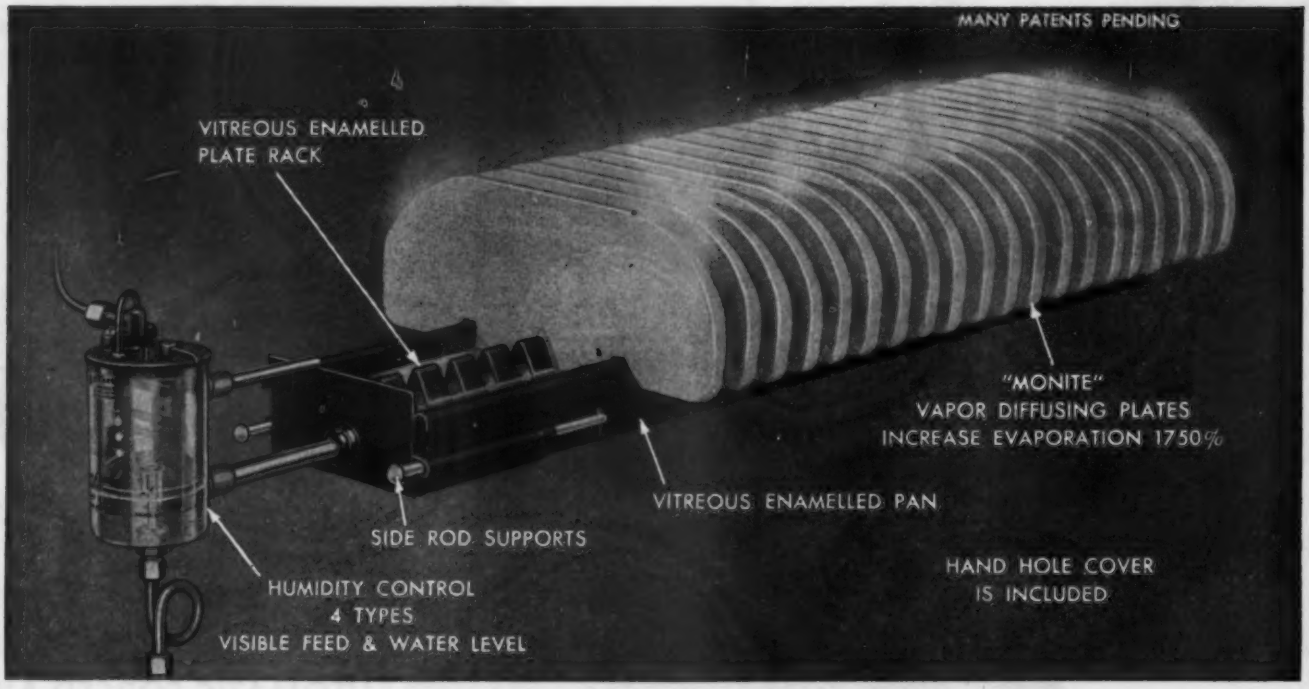
THE IDEAL HEATING UNIT FOR ANY TYPE OF HOUSE

In the construction of Counterflow furnaces, Certified has included every detail in furnishing complete home heating comfort. Designed for oil, gas, stoker or hand firing these units are being built in sizes suitable to any home heating requirement.

Entire heating unit with heat saver, filters, blower, motor and burner are enclosed in an attractive enamel casing. Installation and assembly is simplified by Permaweld construction of the furnace body and special design of the casing. Write for full descriptive literature on the Counterflow and other Certified heating equipment.



CERTIFIED FURNACE CO.
DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY
1000 BERRY AVE. ST. PAUL 4, MINN.



When It Comes to

HUMIDIFIERS – MONMOUTH is TOPS!

—Available NOW!

YES, dealer enthusiasm everywhere for Monmouth Humidifiers is natural, for they result in easy, EXTRA sales, made while you are selling, installing, or servicing almost any heating job.

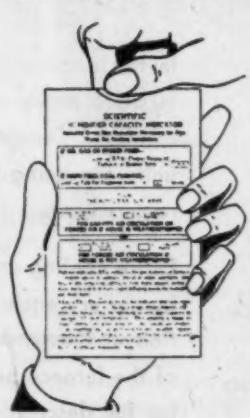
Remember that Monmouth makes a very complete line of humidity controls, in various sizes to fit every need:

1. **FLOTROL Humidifiers—the finest device available for a warm air or air conditioning job.**
2. **MIRCRO-FEED Humidity Control—for drip feed operation—the simplest and most inexpensive humidity control, but a high quality device in every respect.**
3. **Monmouth HUMIDITY CONDITIONER—a superbly engineered and built gas-operated unit for all radiator heated buildings.**

Proper humidity is well recognized as a vital element in healthful heating. Every heating system, new or old, should have a dependable humidifier. Efficient performance is assured by the Monmouth service record on thousands of installations. Correctly installed, any Monmouth Humidifier is a perfected, inexpensive device, which gives many years of trouble-free service. Insist on Monmouth on your jobs. Available for delivery NOW.

• ***Descriptive bulletins and prices sent on request.***

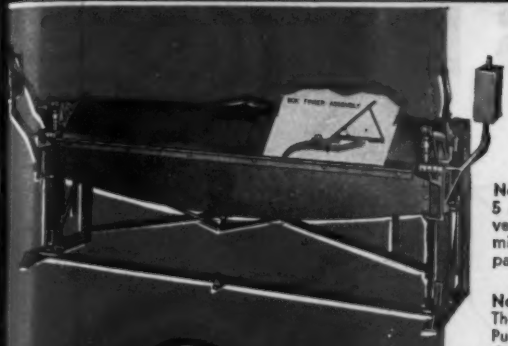
Send for FREE Monmouth Humidifier Guide



Send for this FREE Monmouth Humidifier Capacity Indicator. You will find it useful as a new, quick, method of figuring humidifier requirements for any job. It takes account of variable conditions such as type of heating system, kind of fuel, size of heating unit, weather stripping, etc. It gives area of water surface or number of Monite plates required. Mailed free at your request.

THE CLEVELAND HUMIDIFIER CO., 7802 Wade Park Ave., Cleveland 3, Ohio

WHITNEY-JENSEN TOOLS



BENDING BRAKES. The Whitney-Jensen combination roller bearing bending brakes (shown) represent a modern departure from the old conventional hand brake design. All standard sizes from 4' to 10' available. Also available (not shown) are 18 gauge and "air conditioning" models.

No. 5 JR. METAL HAND PUNCH. The Whitney-Jensen No. 5 Jr. metal hand punch is powerful, light in weight, and very easy to use. Capacity 1/4" hole through 16 gauge mild steel, depth of throat 2", furnished in either metal or paper box.

Nos. 129 and 130 DEEP THROAT POWER PUNCH PRESSES. The Whitney-Jensen No. 129 and 130 Deep Throat Power Punch Presses have these distinctive features: high speed, deep throats, all steel welded frames, inexpensive auxiliary attachments and various punches and dies from stock. Capacity, 10 tons. Throat depths, 12" and 18".

Nos. 7. 7½, 8-IMPERIAL ROLLER BEARING PUNCHES. General-purpose lever-action punches of widely proved serviceability. Will punch and strip positively inside 90°. Punches and dies can be changed quickly. There is no lever to become disengaged by moving too far in either direction. Three sizes, with capacities of 1/4" hole in 1/8", 3/16", and 1/4" mild steel respectively. Three punches and dies furnished.

Nos. 1828, 1829, 1858, 1868 DEEP THROAT LEVER PUNCHES. A versatile machine suitable for a wide variety of work. Made in 7", 10", 18" and 24" throat depths. All-steel-welded frame and stand. Powerful geared action. Capacity, 7½ tons. Throat height, 6", die space 3¼". Standard equipment includes depth and side gauges, punch holder, die adaptors, die shoe, and one punch and die.

No. 20 BALL BEARING PUNCH. A portable tool of universal use. It weighs only 18 lbs. yet easily develops 39,500 lbs. punching pressure because of screw press action with ball bearings in the race. A convenient base, shown, can be used to set this tool up on a bench or in a permanent position. Capacity, 1/2" hole in 1/2" mild steel, throat depth 2¼", throat height 1⅜". One punch and die furnished, ratchet handle available.

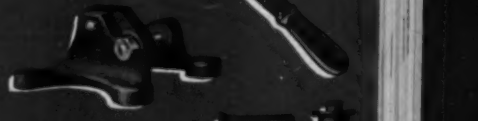
Nos. 28, 29, 58, 68 DEEP THROAT TOGGLE ACTION FOOT PRESSES. Deep throats and powerful punching action permits handling a wide variety of work including pieces previously beyond the scope of similar equipment. Made in four popular throat depths—7", 10", 18", 24". Capacity, 5 tons or 2" hole in 16 ga. mild steel. Operators often handle 100 pieces a minute or better. Throat height 6¾", length of stroke 1", stroke adjustment ¾". Standard equipment includes depth and side gauges, punch holders, die adaptor, die shoe, and one punch and die set.

No. 10 BALL BEARING PUNCH. The No. 10 is the smallest of a "family" of Whitney-JENSEN punches (Nos. 10, 11, 12, 20, 24, 25, 26, 27, 40) famous for tremendous punching power with very light weight. Because of portability and power combined, these punches will pay for themselves quickly in time and money saved even on one small job. No. 10 has a capacity of 3/8" hole in 1/4" mild steel and weighs 9½ lbs. Throat depth is 1⅝", throat height ⅞". One punch and die furnished.

No. 72 SERIES POWER SQUARING SHEARS. Features of Whitney-JENSEN Power Squaring Shears include flywheel and motor enclosed between housings, housings made of steel plate, high speed for production work, and simplified blade adjustment. Available in four sizes—36-in. and 42-in. width, 16 ga. capacity, in 42-in. width, 14 ga. capacity, and in 60-in. width, 12 ga. capacity. Efficient machines for jobbing or production work.

No. 247 18-INCH PRESS BRAKE. This small-sized press brake will aid in cost reduction where there are quantities of small formings being done in large presses. The frame is of welded steel construction, workmanship of the highest quality, the operation simple, and maintenance reduced to a minimum. Specifications include 1" length of stroke, 1" lower beam adjustment, 11½" throat height, 6¼" throat depth, speed 47 strokes per minute. Capacity is 14 ga. mild steel over ⅞" 90° V die, or 4½ tons. Ram and die shoes take standard 1/2" tongues.

Write for new Whitney-JENSEN
Catalog No. 16-45 ready soon.



WHITNEY METAL TOOL COMPANY

21 FORBES STREET • ROCKFORD, ILLINOIS

SURPRISE!

Keep your eyes open

when you come to the Air Conditioning Exposition at Cleveland, January 27 to 31, 1947. You will see the very latest and most modern equipment—the newest ideas—the smartest developments.

TORIDHEET HAS A SURPRISE FOR YOU—SEE IT AT BOOTH 178 & 277

Not a word about it here—just a cordial invitation to *you* to come and look things over for yourself. We believe you will be interested. We know you will be pleased—that's putting it mildly!

at The Air Conditioning Exposition
SEVENTH INTERNATIONAL
HEATING AND VENTILATING EXPOSITION
Lakeside Hall • Cleveland

TORIDHEET DIVISION

CLEVELAND STEEL PRODUCTS CORPORATION, CLEVELAND 2, OHIO

Affiliated Canadian Manufacturers: Conroy Manufacturing Company, Ltd., Catharine St., St. Catharines, Ont.

OIL BURNERS • OIL BURNER BOILERS • OIL WATER HEATERS
AIR CONDITIONING UNITS • COAL AND GAS FURNACES

Every House Needs Chimney Flashings

. . . make them *COPPER*

IT DOESN'T take much sheet copper to flash a chimney. So use this durable metal on every job.

Even on small, inexpensive homes . . . not to mention larger residences and other buildings . . . it pays to use copper not only for chimney flashings, but also for ridges, valleys, gutters and downspouts.

As you know, copper is an easy metal to work with . . . readily bent, formed and soldered. Possessing adequate strength and toughness, freedom from rust, and a high degree of corrosion resistance, copper provides lasting, low-cost protection.

Right now is the time to let this durable, rustless metal build good will for *you*.

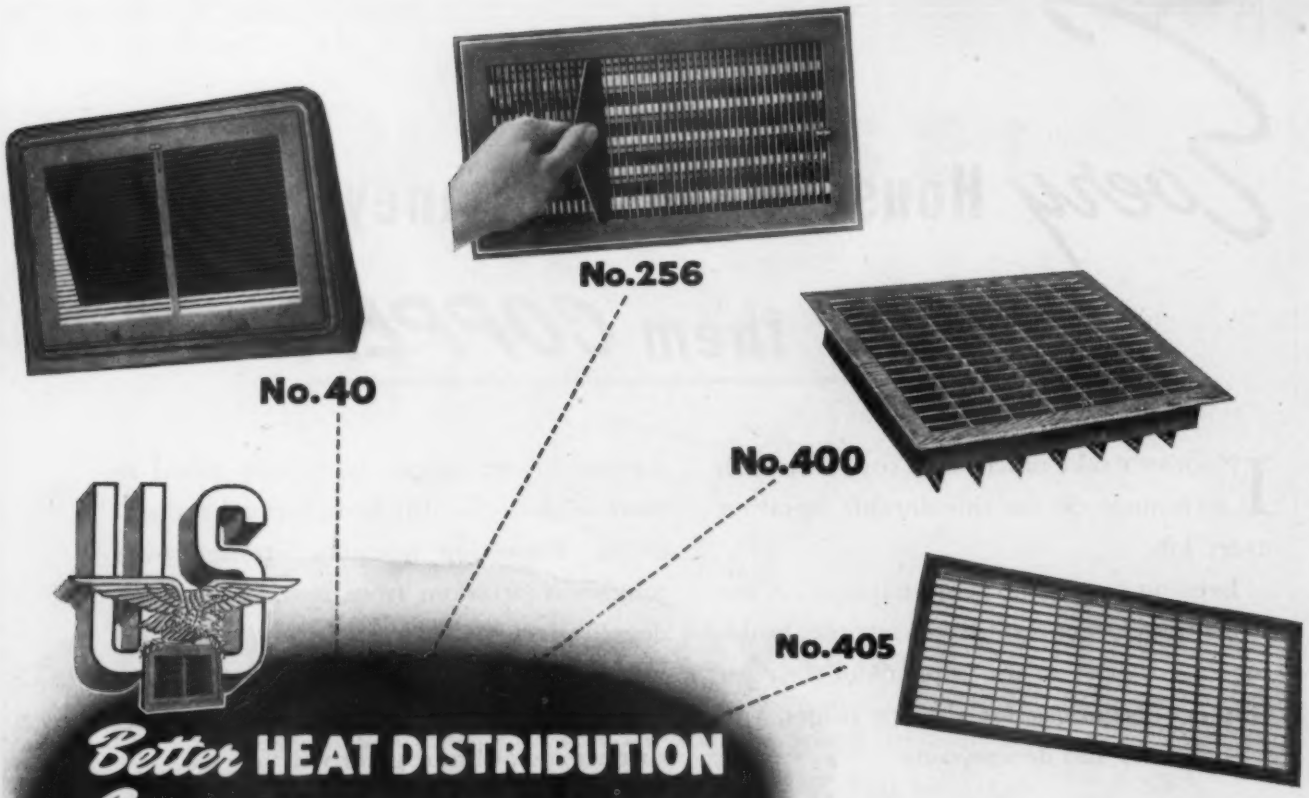
ANACONDA *Anaconda* SHEET COPPER

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*



NO. 40 SERIES U. S. GRAVITY BASEBOARD REGISTERS

Two-piece construction—with removable center—helps secure tightest possible fit to prevent wall-streaking, saves on installation costs.

NO. 256 4-WAY FLOW A-C REGISTERS

These are the finest of Air-Conditioning Registers. Uniquely designed, simplified, multiple-valves control up or down air-deflection with a minimum of resistance—operate smoothly. Grille bar deflection easily changed with the handy setting wrench to control lateral airflow.

NO. 400 TRUSSTEEL FLOOR REGISTERS

The finest improvement in many years in floor registers—multiple valves run SHORT WAY for easier operation, cleaner walls. Heel-proof grille. Smooth SEAMLESS CORNERS.

NO. 405 TRUSSTEEL COLD AIR FACES

Band Steel bars of unusual strength are assembled into a grid corner that supports far above usual weights yet gives you a cold air return with 82% free area, and heel-proof mesh.

Write for your '47 catalog. Now Ready for mailing.

The 1947 skies are bright for the heating industry—with the greatest backlog of orders in history. Yet current buying trends indicate that competition for sales will come back with a rush.

Standardizing on the U. S. line will help you meet that problem. Whether you have contracts for the simplest low-cost cottages or the finest residential installations, U. S. has designs to handle the jobs.

Every U. S. Register is carefully engineered for greatest efficiency and minimum installation cost, available in standard finishes to harmonize with room surroundings, and manufactured with production economies to come within the heating budget.

UNITED STATES REGISTER CO.

Battle Creek, Mich.

BRANCH WAREHOUSES IN MINNEAPOLIS : KANSAS CITY : ALBANY

THIS COMPLETE LINE FOR

VICTOR

COAL, OIL OR GAS...

WITH EXCLUSIVE HEAT RADIATING

FINS

...takes you out of the competitive class

Heat Radiating FINS Save Fuel

More hot metal heats more air!

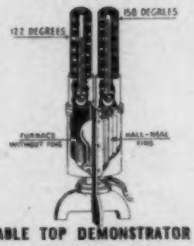


TABLE TOP DEMONSTRATOR with twin thermometers in miniature furnace. Proves extra heat provided by FINS!

Quality Plus Beauty Means

- ✓ MORE SALES
- ✓ MORE PROFIT
- ✓ EXCLUSIVE FEATURES
- ✓ EASY INSTALLATION

.. Sell Victor in '47

Production is now permitting us to accept a few new accounts . . . and VICTOR—the furnace with the exclusive Heat Radiating *FINS*—is your answer to consumer demand for PERMANENT SATISFACTION. Write us for full information. The VICTOR line, famous since 1890, will make YOU money in '47.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

FURNACES • OIL BURNERS • STOKERS • GAS BURNERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

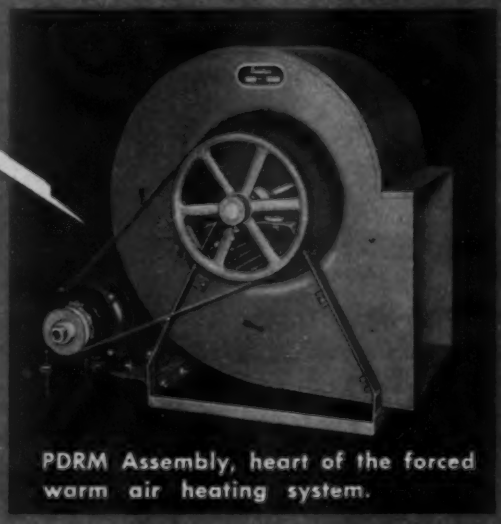
1322 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

Brundage BLOWERS

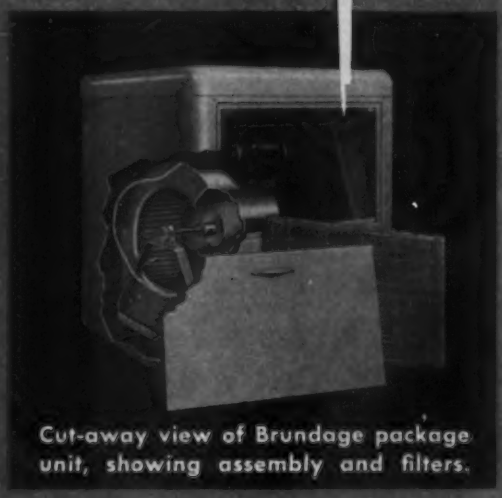
BETTER DESIGNED

BETTER BUILT

BETTER ENGINEERED



PDRM Assembly, heart of the forced warm air heating system.



Cut-away view of Brundage package unit, showing assembly and filters.

Because of their reliability of performance, *furnace manufacturers* who wish to attain maximum efficiency from their forced warm air heating units, ask for Brundage Blower Assemblies . . . Whether its a conversion job or the installation of a new heating plant, *dealers* ask for expertly styled Brundage blower-filter cabinet units to give their customers maximum comfort together with the assurance of dependable, economical operation.

THE Brundage COMPANY

Blower Specialists Since 1919

KALAMAZOO 11, MICHIGAN

Specify ANEMOSTAT

DRAFTLESS AIR-DIFFUSION . . . . . for an air-conditioning job you'll be proud of!

The best "advertising" for functional-minded architects, engineers and contractors is the excellence of their own craftsmanship . . . represented by modern structures that make living and working more pleasant. That is why they invariably regard an air-conditioning installation with Anemostat draftless air-diffusion as a job well done. A job that *advertises* them. A job to be proud of!

Anemostat takes the "raw materials" of air-conditioning and actually "processes" them into COMFORT. There are no draft-producing grilles or registers, for Anemostat air-diffusers distribute the conditioned air in pre-determined, controlled patterns. Result: there are no drafts . . . no dead air pockets . . . *room temperature and humidity are equalized throughout.*

Because Anemostat wall or ceiling diffusers permit employment of stepped-up duct velocities and greater temperature differentials, duct sizes and duct outlets may be reduced — an important economy feature. Because Anemostats have no moving parts to wear out, maintenance cost is nil.

Thousands of Anemostat installations throughout the country — in virtually every industry — are putting new comfort into air-conditioning. So, remember to specify Anemostat draftless air-diffusion for an air-conditioning job you'll be proud of!

HOW ANEMOSTATS *COMPLETE* AIR-CONDJTIONING

The patented Anemostat distributes air — of any duct velocity — in all directions and in a multiplicity of planes. Simultaneously, counter-currents created by the device siphon *into the Anemostat* room-air equal to about 35 per cent of the volume of the supply air. This room-air is mixed with the supply-air *within* the diffuser before the air-mixture is discharged into the room. Furthermore, velocity of the incoming air is instantly reduced within the Anemostat by air-expansion.

In this way, the Anemostat noiselessly diffuses air of any duct velocity throughout the entire room . . . eliminates drafts . . . closely equalizes temperature and humidity . . . prevents air-stratification. There is no substitute for Anemostat air-diffusion!

Write for information.

ANEMOSTAT

REG. U. S. PAT. OFF.

ANEMOSTAT CORPORATION OF AMERICA
10 East 39th Street, New York 16, N. Y.
REPRESENTATIVES IN PRINCIPAL CITIES

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR DISTRIBUTION"

AD-1117

REPAIR PARTS

FOR ALL
FURNACES, BOILERS
AND
OTHER HEATING UNITS

BRAUER
REPAIR PARTS
STOVE FURNACE BOILER
OIL STOVE RANGE

WE SPECIALIZE IN GENUINE REPAIRS

ALSO IN STOCK—READY TO SHIP—ALL APPROVED BRANDS OF

Blowers	Fittings	Pipe
Cleaners	Gas Burners	Registers
Controls	Humidifiers	Roof Coatings
Dampers	Metal Screws	Stokers
Draft Controls	Oil Burners	Water Coils

DISTRIBUTORS OF

FIBERGLAS DUSTOP FILTERS, INSULATION & ROOFING

BRAUER INSULATING PRODUCTS

NON-CON-DUX PRODUCTS

ASBESTOS

PAPER—CEMENT—BOILER COVERING—
PIPE COVERING—MILLBOARD—TAPE
WOOL FELT PIPE COVERING
DUCT INSULATION

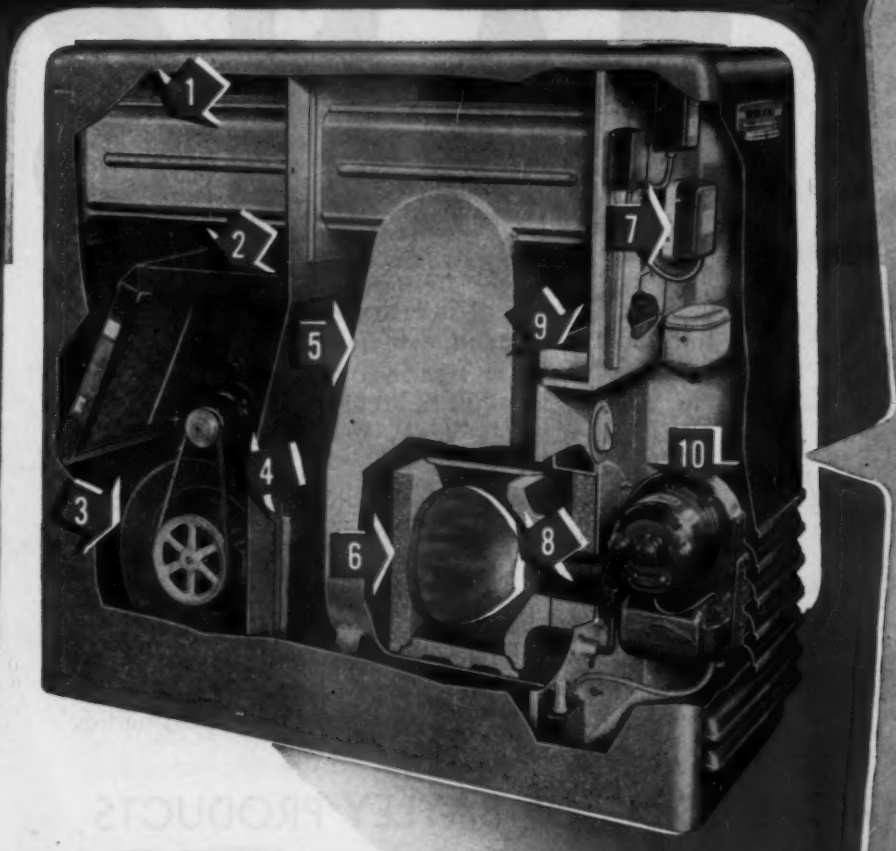
A. G. BRAUER SUPPLY CO.

2100 WASHINGTON AVE. ST. LOUIS 3, MO.

Read the Story of *Greater Profits*

in this cutaway view of

HEIL'S NEW ACTIV-AIR OIL-FIRED FURNACE



THESE ARE THE FEATURES *YOU* ASKED FOR TO MAKE SALES EASIER

1. Quadruple, streamlined flue passages, effectively baffled, assure maximum heat transfer efficiency.
2. Large-area, replaceable filters provide clean air with minimum resistance to flow.
3. Oversize, low-speed blower is base mounted to reduce noise and vibration—provides ample capacity for large houses with low heat loss.
4. Quieter, smoother operation is assured by three-point, floating power motor mount.
5. Gas-tight, shielded-arc and seam welded heat exchanger of copper alloy steel assures long life.
6. Pre-cast combustion chamber brings flame to efficient operating temperature instantly—minimizes sooting.
7. Primary control, limit switch and fan control are front mounted for accessibility—all wiring in color coded harness.
8. Flame of symmetrical pattern and stable front maintains high CO_2 efficiency and eliminates pulsation even at low firing rates.
9. Automatic humidifier instantly accessible through low level door in front panel.
10. Bracket-mounted burner has ample space on all sides for inspection or adjustment when unit door is removed.

What you see here is the inside story of a basically new and different kind of furnace-burner unit that brings you every important sales feature you've always wanted . . . *but never had before!*

Here, feature by feature, you see the full evidence of Heil engineering leadership. You see what five years of tireless research and development have accomplished in reducing noise and vibration to a minimum . . . in achieving new peaks of efficiency and operating economy through improvements in every phase of combustion . . . and in vastly reducing installation and service costs by painstaking attention to the accessibility of every design.

YOU CAN'T AFFORD TO HANDLE ANYTHING BUT THE LEADER

Heil's new "Activ-Air" Furnace-Burner Unit brings you in one package thrilling new styling that assures more sales . . . advanced engineering that keeps you ahead of competition . . . and the quality construction for which Heil products have been famous for over a quarter of a century. Here is the unit that means more profits for you because it's designed the way *you* want it!

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

GET THE FACTS ON A HEIL FRANCHISE BEFORE YOU DECIDE

Your choice of a line decides your profit picture . . . that's why you'll want all the facts about a Heil franchise now. Here's what it means to you . . . a friendlier method of doing business . . . realistic quotas . . . whole-hearted co-operation . . . and intelligent merchandising assistance. Mail the coupon today for Heil's book showing all models in full color and giving complete details on the franchise that means more profits for '46.

MANY VALUABLE TERRITORIES STILL OPEN

THE HEIL CO., Dept. A-1
Milwaukee 1, Wisconsin

Please send me your new dealer specification sheets showing full color reproductions of Heil 1946 Boiler and Furnace-Burner models with complete details about a Heil franchise and openings in my territory.

Name .....

Company .....

Address .....

City ..... Zone .... State .....

Manufacturers of Quality Automatic Heating Equipment Since 1924

Bayley "CUSTOM BUILT" FANS

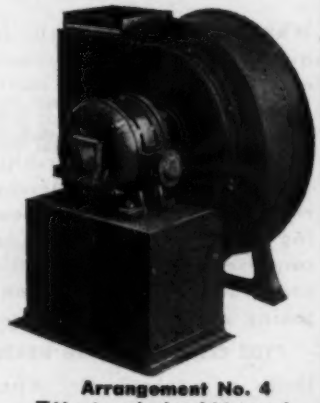
Arrangement No. 2
Overhung blast wheel and pulley, regularly equipped with roller bearings.

Bayley "Ex" Exhaust Fans, custom built to meet the individual needs of industry, are without a doubt the most advanced, efficient and durable fans available. Built in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM capacity with pressures up to 15" W.G., they cover a wide range of applications in all types of industrial plants. Bayley "Ex" Fans are designed and constructed to operate faultlessly under the most adverse conditions . . . they can be made explosion proof . . . non-ferrous . . . and are produced in stainless steel to handle high temperature gases up to 1600° F. Bayley Blowers give assurance of lasting, trouble-free service . . . and will do your specific job better. Investigate their possibilities for your particular purpose NOW!

TYPICAL USERS OF BAYLEY PRODUCTS

Arrangement No. 1
Overhung blast wheel, pulley drive, regularly fitted with ring oiling bearings. (Ball bearing optional)

Allis-Chalmers Mfg. Company
The American Monorail Company
Armour & Company
The Borden Company
Briggs & Stratton Corporation
Carnegie Illinois Steel Corporation
Chrysler Corporation
Cleaver-Brooks Company
The Day Company
Despatch Oven Company
Diamond Iron Works, Incorporated
And the Mahr Mfg. Company Division
The Dow Chemical Company
Dravo Corporation
Ford Motor Company
Harnischfeger Corporation
The Heil Company
Marquette Cement Mfg. Company
Nash Kelvinator Corporation
The Pennsylvania Railroad Company
Phoenix Hosiery Company
A. O. Smith Corporation
A. E. Staley Mfg. Co.
Swift & Company



Arrangement No. 4
Housing wheel and Motor subbase only for direct motor drive.

CONSULT US ON YOUR ENGINEERING PROBLEMS

BAYLEY BLOWER CO.

1817 SOUTH 66TH STREET MILWAUKEE, WISCONSIN

chicago

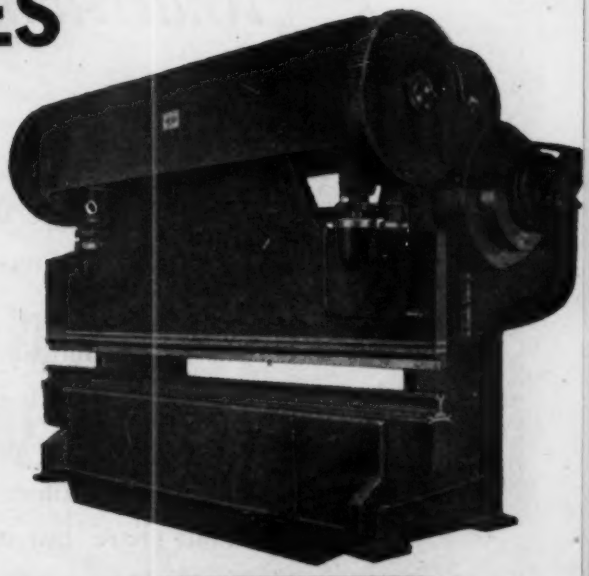
STEEL PRESS BRAKES

SPEEDY, precise, efficient production that will assure more sheet metal products is what we all are striving for.

Yes, this ever-increasing production means many shops and plants must make equipment additions to keep the ball rolling . . . and that's where CHICAGO Steel Press Brakes do their part to perfection.

Ruggedly constructed to assure long-life and trouble-free service, they do their given tasks, quicker, better and more efficiently. Made in sizes to handle steel sheets from 4 to 20 feet in width, and incorporating many exclusive features in design and operation, they will fit into your shop, solve your particular production problem . . . and reduce operating costs.

Save Time . . . the most important factor with D & K CHICAGO Steel Press Brakes . . . Full information and catalogue will be sent upon request.

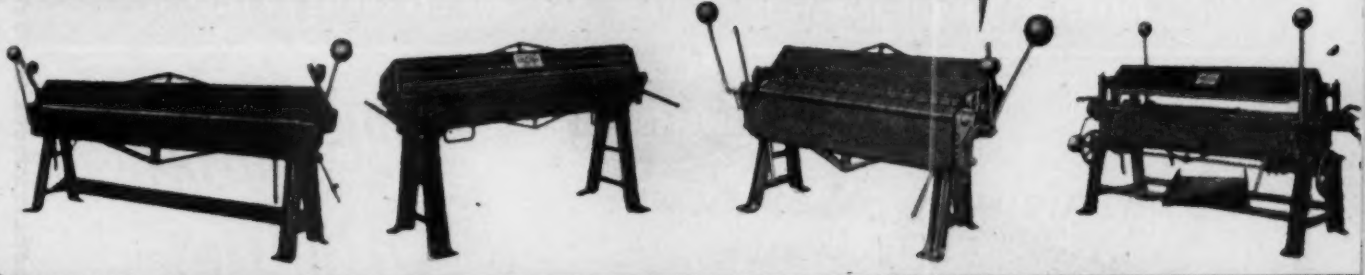


CHICAGO—Series D Steel Press Brake has exclusive non-deflecting bed, automatic friction brake, and automatic oiling systems. Sizes 4 to 20 ft. capacities up to 5/8" plate.

Standard and Heavy Duty Series . . . handles sheets from 37" to 72", cushioned-type clutch, zerk-alemite lubricating systems, quick adjustment features, variable speed drive, compact, sturdy constructions.

Also Remember

CHICAGO Hand Bending Brakes of all Types



Standard hand brake, one-man operation.

Portable hand brake. Light weight, maximum strength, powerful clamping.

Box and Pan Brake. Adjustable and removable fingers permit any size box or pan to be formed.

Adjustable Double Brake for forming two bends at one setting.

DREIS & KRUMP MANUFACTURING CO.

7404 LOOMIS BOULEVARD · CHICAGO, ILLINOIS

Understanding Confidence . . .

These are trying times, never before experienced in business relations. As you know we have been making quality furnaces and air conditioning plants for over forty years.

Since V-J Day, conditions have been such as to try the "patience of Job." The steel mills and foundries, together with manufacturers of controls and other supplies, have been swamped with orders. They have had to allocate proportionately to everybody. We have received our share, but it has not been sufficient to take care of our requirements in order for us to supply you with the heating plants we know you desire.

We have confidence that the manufacturers producing our needed supplies are doing everything to get materials to us, but we understand why they cannot give us more than our share of their production —they just cannot produce enough for everybody's present needs.

Here at our headquarters, we are doing everything humanly possible to manufacture and ship heating plants to you promptly and we ask that you bear with us with understanding and confidence.

WISE FURNACE COMPANY

AKRON 8, OHIO

You don't have to sell them HEALTH!

Every home owner knows the discomforts of dry hot air. Health authorities agree that moist air prevents colds and respiratory ailments, promotes health and vigor. Every home owner wants the kind of healthful comfort that is provided only by Thermo-Drip Heat Regulated Humidifiers.

Thermo-Drip Humidifiers moisten the air as it is heated—*in direct proportion to temperature.* Thermo-Drip Humidifiers positively regulate water feed and accurately control the amount of evaporation so that the minutely correct percentage of moisture is added to the air at all times. Thermo-Drip equipped furnaces give your customers the kind of health protection that doctors approve.

Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation. Made in a variety of pan sizes for every type or make of warm air furnace. Write today for all the facts —or see Thermo-Drip Humidifiers at the Cleveland Exhibit January 27-31, 1947.

THERE'S A THERMO-DRIP HUMIDIFIER FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE

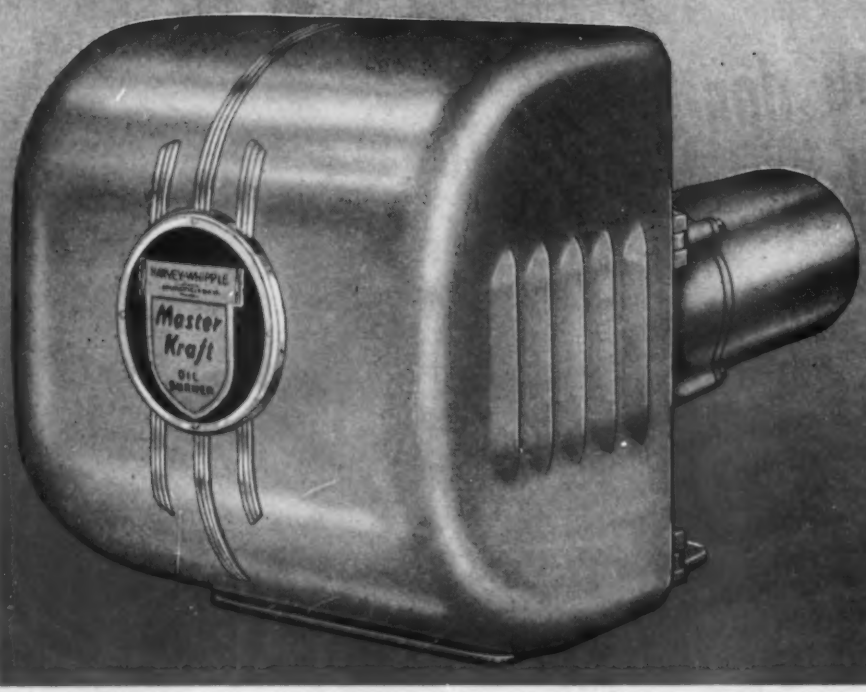
THERMO-DRIP
HEAT REGULATED
HUMIDIFIERS

Made by
Automatic HUMIDIFIER CO.
CEDAR FALLS . . IOWA

The NEW *Master Kraft* CONVERSION BURNER

REG. U. S. PAT. OFF.

READY WHEN MATERIALS PERMIT MANUFACTURE



HERE...AT LAST...

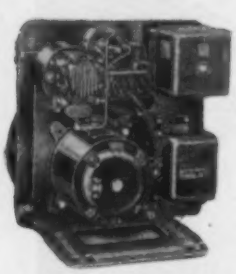
are pictures of the *new* Master Kraft conversion oil burners.

The new quick-change service units will amaze you . . . you may easily change pump, motor, or transformer in two minutes, as shown below.

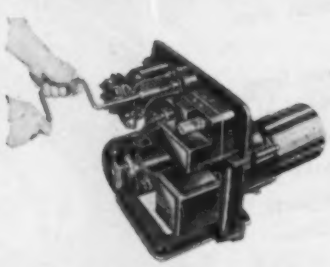
A NEW HIGH IN EFFICIENCY!

These new burners employ a brand-new principle of combining oil with oxygen to give highest operating efficiency under all draft conditions. The new DUAL-OXENIZER (Patent applied for) imparts a new standard of performance to oil burner operation. Only after you have seen it perform, will you realize the great advance it represents.

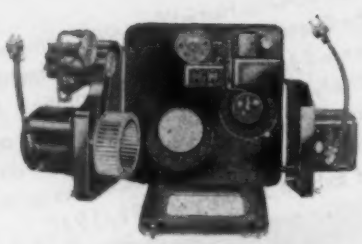
These new burners will be available in four models ranging from 1 to 20 GPH.



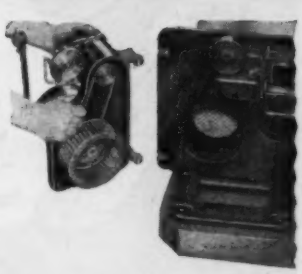
A rear view of the burner with cover removed. All parts easily accessible, convenient to work on. MORE THAN THAT . . .



The motor, pump or transformer *can be changed in two minutes!* Simply disconnect the new fuel line joint with special wrench as shown above. THEN . . .



Unplug two electric connections—and *swing open* the service units, like two doors, as shown above.



NEXT—pull two pins and remove the unit, replace it with a new one! This means quick, easy simplified service. THE ENTIRE QUICK-CHANGE TAKES ONLY TWO MINUTES TOTAL CONSUMED TIME.

Exhibited at the 7th Inter. Heat. and Vent. Exposition,

HARVEY-WHIPPLE, INC.
Dept. AA-3, Springfield, Mass.

Please send me full details on the new Master Kraft oil heating equipment.

Name_____

Address_____ State_____

City_____

HARVEY - W

SPRINGFIELD,

The NEW *Master Kraft*
REG. U.S. PAT. OFF.

SUN - BLAZE BOILER

READY WHEN MATERIALS PERMIT MANUFACTURE

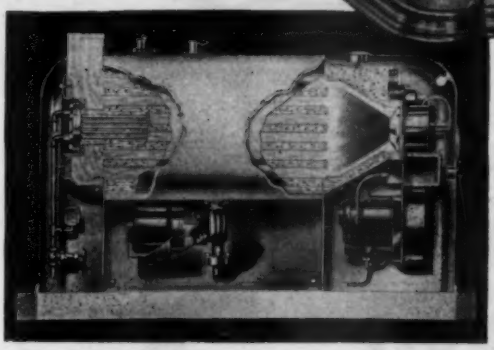
READY TO FIRE WHEN IT REACHES YOU

Comes to you *complete* in a shipping case—small enough and light enough so two men can skid it down the cellar stairs—knock off the boards and there she sits, ready to connect up and fire.

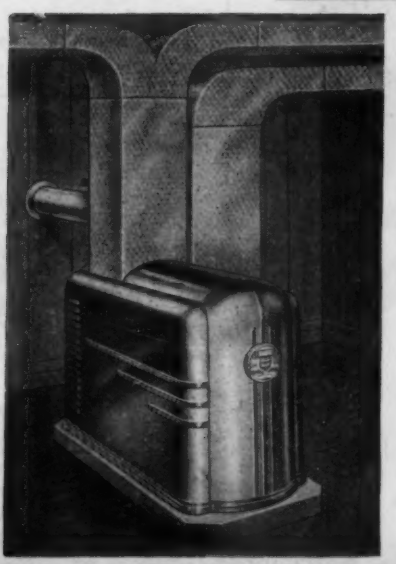
No heavy furnace or boiler sections to assemble—no combustion chamber to build—no conversion burner to set in place—no controls to wire—no jacket to assemble. It is all done AT THE FACTORY.

These boilers are new inside and out. Will be available in three sizes up to 750 feet steam, 1000 feet hot water. Stainless steel combustion chamber and heating surfaces for long life. For full details mail coupon at lower left.

EXHIBITED AT THE 7TH INTER. HEAT. AND VENT. EXPOSITION, BOOTH 503, JANUARY 27-31, 1947 CLEVELAND, OHIO



Cross section of the new Master Kraft Sun-Blaze Boiler showing compact design, stainless steel "Sun-Cone" combustion chamber stainless steel tubes. If ordered for forced hot water, the circulator too, is built-in and wired, as shown.



NEW MASTER KRAFT *WARM-AIR* CONDITIONERS

These new warm air units are compact—occupy only a third the space of prewar units of equal heating capacity—are handsome in appearance, and are all *prefabricated* at the factory—with jacket on, burner built-in, and all wiring complete. Will be made in three sizes from 80,000 to 250,000 BTU.

Booth 503, Jan. 27-31, 1947, Cleveland, Ohio

WHIPPLE, INC.

MASSACHUSETTS

★ *When you buy hand tools ask for* ★

W. A. WHITNEY

No. 1 Punch

Capacity ⅜" hole through ¼" iron

Length 34". Wt. 23 lbs. Depth of throat 1⅞".

Punches and dies ⅛" to 9/16" by 1/64"

No. 2 Punch

Capacity 5/16" hole through ¼" iron

Length 23". Wt. 14 lbs. Depth of throat 1-11/16"

Punches and dies 3/32" to ½" by 1/64"

Channel Iron Punch

(A companion to No. 2 Punch)

Capacity ¼" hole through ¼" iron

Length 23". Wt. 17 lbs. Depth of throat 1⅞"

Punches and dies 3/32" to ½" by 1/64"

HERE'S WHY—

There's a Whitney tool for *every* job, and *every* tool has these Important Features—

- *Simple Design*
- *Sturdy construction for hardest kind of service*
- *Well distributed weight, making tool easy to handle*
- *Drop forgings of high grade alloy steel on all main parts*
- *Heat treated wearing parts*
- *Guarantee against defect in materiat and workmanship*

Extra punches and dies are of A-1 grade tool steel, expertly heat treated and tempered

The Registered Trade Mark

which appears on all W. A. Whitney tools and extra punches and dies is the manufacturer's promise that they will give entire satisfaction and the utmost in service.

Illustrated are a few Whitney Hand Lever Punches. Write for our catalog giving full information on all sizes and styles, or ask your jobber.

Buy W. A. Whitney tools from your jobber

No. 4-B Tinner's Punch

Capacity ¼" hole through 16 gauge iron

Length 8½". Wt. 3 lbs. Depth of throat 2"

Punches and dies 1/16" to 9"32" by 1/64"

No. 6

Skylight, Ventilating and Tank Flange Punch (Especially adapted for button punching)

Capacity ¼" hole through 3/16" iron

Length 26½". Wt. 10½ lbs. Depth of throat 1¾"

Punches and dies ⅛" to 9/32" by 1/32"

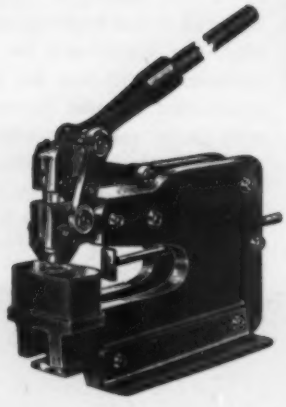
No. 8-B Punch

Capacity ¼" hole through ⅛" iron

Length 18½". Wt. 7½ lbs. Depth of throat 2"

Punches and dies 1/16" to 7/16" by 1/64"

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.



No. 92 Bench Punch

(Uses No. 91 punches and dies)

Weight 165 lbs. Depth of throat 10"

No. 91 Bench Punch

Capacity ½" hole through ¼" iron
¾" hole through 3/16" iron
2" hole through ⅛" iron

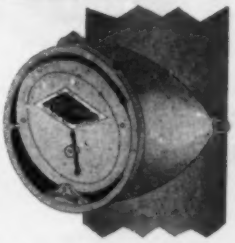
Weight 82 lbs. Depth of throat 5"

Punches and dies ⅛" to 2"

Channel Iron

2½" Flange x ¼" Web
Angle Iron
2½ x 2½ x ¼"

Think This Over!



WALKER FUEL SAVER TYPE NO. 34
maintains proper draft regulations under all conditions for furnace, boiler, stove or hot water heater. Domestic sizes 4" to 20" inclusive, furnished with or without collar, in either Galvanized metal or Cadmium Plated finish, if and when available.

COMMERCIAL AND INDUSTRIAL FUEL SAVER DRAFT REGULATOR
Walker makes a full line of industrial controls. Sizes 16" to 36" inclusive, made of heavy cast ring with deep-drawn flanged steel plate with adjustable ball-bearing construction. For use with the heaviest drafts and any kind of fuel.

WALKER FUEL SAVER TYPE 34-B AND 34-C WITH STOVE PIPE TEE JOINT
More than 5,500,000 units of these famous WALKER Regulators have been installed for the fuel users of America. Furnished in sizes 3" to 10" inclusive, in blue, chrome or cadmium, if and when available, and packed in individual cartons or bulk.

REMEMBER!

WALKER IS AN EXCLUSIVE MANUFACTURER OF AUTOMATIC DRAFT REGULATORS. HE DOES NOT COMPETE EITHER DIRECTLY OR INDIRECTLY WITH ANY MANUFACTURER OF ANY KIND OF HEATING UNIT.

Millions of Tons of the nation's vital fuel supply can be saved throughout the 1947 heating season by the installation of proper Automatic Draft Controls.

Never in the history of the Heating Industry has there been a more critical condition in the fuel supply of America.

As a Stove or Furnace Manufacturer, Distributor or Dealer this is your opportunity to serve your nation, and at the same time build for yourself a secure Postwar business.

Why not start today making a survey of the heating units in your territory? Walker Automatic Draft Regulators should become a permanent part of every heating unit. They are easy to install, but best of all—a money-making addition to your line.

FUEL — SAVING STARTS WITH DRAFT CONTROL

Millions of WALKER AUTOMATIC DRAFT CONTROLS are at work Day and Night in Manufacturing Plants, in Army Camps, in Public Buildings and in the Nation's Homes conserving fuel. Could there be better proof of Walker's unrivaled quality in Automatic Draft Controls?

Walker manufactures an AUTOMATIC DRAFT REGULATOR for any type of heating system, from the smallest domestic to the largest industrial unit using any kind of fuel.

All Walker Products are Listed as Standard by The Underwriters' Laboratories.

WALKER MANUFACTURING & SALES CORPORATION
1711-15 PENN STREET ST. JOSEPH, MISSOURI

TWELVE KEYS to Steel-Service

Ryerson Steel-Service plants now stand in twelve great cities—key points covering the nation's principal steel markets. Cooperating fully, the twelve-plant Ryerson system means broader facilities, shorter shipping distances, and the assurance of prompt delivery of all products in stock.

The plant near you employs the best of modern handling and cutting methods, from order desk to shipping department. It is planned and operated to meet your steel needs accurately and deliver them in a hurry.

Under present conditions we are often unable to fill all your requirements—much as we would like to. Because of great demand and frequent work stoppages many products may not be in stock when you call. But if your order includes an item not readily available, our steel-service men are well qualified to assist you in the search for a practical alternate. And Ryerson continues as your best source for a wide variety of steels.

Whether you need a single piece of steel or several tons, your order receives thorough, personal attention. So, phone or write or wire your nearest Ryerson plant whenever you need steel.

Joseph T. Ryerson & Son, Inc, Steel Service Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

PRINCIPAL PRODUCTS

Bars—
hot and cold rolled
alloy steel
reinforcing
Structurals
Plates—
Inland 4-Way Floor Plate
Sheets
Strip Steel
Mechanical Tubing
Boiler Tubes and Fittings
Alleghony Stainless—
Sheets, plates, shapes, bars, tubing, etc.
Tool Steel
Wire, Chain
Bolts, Rivets
Babbitt
Solder
Wire Fabric
Metal Working Tools and Machinery, etc.

RYERSON STEEL

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Quick Look at 1946 — AA's Guess For 1947

WITH a great deal more tangible evidence at hand than existed one year ago, American business enters the coming year with the assurance that, if things go as they should, the next twelve months will be busy ones for most industries One year ago, as now, the construction industry seemed especially favored. Now, but not so one year ago, numerous uncertainties have been wiped out—the rate of wiping out having been accelerated beyond all expectations during November and December.

In the closing months of 1946 a national election showed the majority of Americans fed up with control and regulations; a different political party was voted into office with a mandate to remove controls as speedily as possible. As a result of the election, OPA, with its regulation of the citizen's every move, went into the discard. With the election, swift changes began in a long list of unsatisfactory conditions which had become irksome and noxious.

Favorable Expectations

Among many other changes, the following seemingly should insure better conditions for the warm air heating-sheet metal contracting industry: (1) the Veterans Housing Program with its amateurish ideas on how to get houses built has practically been scrapped; (2) the priorities, controls, limitations made part and parcel of the VHP have—or soon will—go into the discard; (3) a controlled building market is giving way to a practically free building market; (4) price control over building materials and the black market which sprang up with VHP will soon be a thing of the past; (5) wage control is done away with; (6) the controversial Taft-Wagner-Ellender housing bill which sought to launch a gigantic public housing program will probably die permanently when Congress convenes.

The outcome of a sixth hindrance is not so clearly discernible. That sixth hindrance is the labor problem. Undoubtedly there is widespread sentiment for some form of labor legislation which will eliminate recurrence of the industry-wide strikes which all but paralyzed America. Any labor organization which calls an industry-wide strike now does so with the odds against success. Many Washington "high-ups" believe there will be no "second round" of big strikes. The last big strike raised the issue as to whether any work stoppage affecting the public welfare shall remain legal. Conflicts which lead to widespread public hardship quickly create public demand for governmental control. Labor does not want governmental control over wages and working conditions.

No plan for labor legislation which can be classed as "punitive" is being seriously considered by new Congressional leaders. And management does not wish such extreme legislation. There should be, however, amendments to the Wagner Act; the program now being considered would, in brief, fix on labor unions much the same restraints that have been imposed on management.

Labor-Management

Some of the problems which face labor and management in the construction industry are:

(1) Wage rates. Adjustment will be reached sooner or later to keep wages in line with post-war living costs, but the effort should be to keep housing costs within the buyer's pocketbook by means of improved methods of construction and maximum output per labor hour.

(2) Jurisdictional disputes have been publicly denounced by many responsible labor officials; this is strictly a problem for labor to handle, but its solution is essential to construction industry peace.

(3) Strikes, either local or industry wide, have been negligible in the construction industry—there are notable instances in our own industry where there has been no strike for as long as 20 years. This is, indeed, a splendid record and reflects great credit on the acumen of the president and officers of our industry's organized labor association. The national labor relations committee representing employers and labor should help greatly to keep this fine record intact.

(4) Improvement in the quality of labor and output per working day has been widely discussed. Generally speaking, both have shown a better record in our trade than in many others. Undoubtedly, this problem will be given thorough and serious attention as the labor relations program gets more completely under way.

(5) The problem of apprentices—ratio to mechanics; G.I.'s or regular; length of training; standards of instruction, etc. are being worked out to the satisfaction of employers and labor and will be determined through labor relations with due respect to possible future labor surplus and a better trained workman.

General Construction

During the first ten months of 1946, according to the F. W. Dodge reports, the total volume of construction contracts awarded in the 37 eastern states amounted to 6½ billions of dollars—a larger total than any year except 1942. In view of the difficulties and confusion this is a remarkable showing, but even more important is the fact that much of this work

is uncompleted and will carry over and to this carry-over will be added (now that controls are removed) a volume of work which will make 1947 the biggest year in building.

Percentage-wise, 1946 was 442 per cent larger than 1945 in residential construction; 195 per cent larger than 1945 in industrial construction; 538 per cent larger than 1945 in commercial construction; 593 per cent larger than 1945 in store, restaurant, garage, etc., construction; but no larger than 1945 in public building.

Most important to our industry is the showing in residential construction—Dodge shows almost 400,000 new dwelling units started in 37 eastern states (78 per cent single family structures); for the country as a whole Dodge estimates 472,000 new dwelling units awarded; N.H.A. estimates 588,000 dwelling units for the whole country; V.E.H.P. reported 286,200 dwelling units completed in the first nine months (113,000 of these were started before January, 1946); only 25,000 of the projected 100,000 prefabricated units were completed.

A Dodge opinion survey late in 1946 showed a majority of manufacturers believing that prices will reach a peak in 1947, followed by some "recession" in construction while prices stabilized.

Whether construction materials and products will obtain a balance between supply and demand in 1947 is a much debated question. Some will; some won't—individual reports following in this survey give a clearer picture.

As for 1947, Dodge estimates these changes: by dollar volume a 10 per cent increase over 1946 in commercial building; a 14 per cent decrease in industrial building; a 38 per cent increase in residential construction. By number of new family dwelling units Dodge says 465,000 in 1946 and 630,000 units in 1947; Bureau of Labor Statistics says 750,000 units in 1946 and 1,012,500 units in 1947.

Steel

Shortages of steel and steel or iron products has been one definite handicap all through 1946. The question is—will this shortage continue in 1947? Most of the reasons for the poor showing in steel in 1946 have been stated numerous times. What was perhaps not so well understood is the fact that even without strikes and price ceilings output of most products using steel could not possibly have satisfied the demand—there just wasn't that much steel. The steel producers are now saying that users of steel (meaning everyone who uses steel in his product) probably cannot hope for more steel in 1947 than the user got in 1941. Users may do well to adjust their sights on this basis and look for substitutes or new materials, say the producers.

This hard fact warrants scrutiny. After all, steel production in 1946 was almost two thirds again as much as 1944 and one third greater than 1929. So here are some reasons for the expected shortage:

(1) Industrial output of users of steel tops any pre-war year by a tremendous margin. (2) Demand for things made of steel far exceeds pre-war standards because of war-time scarcities. (3) It takes more dollars worth of steel for peacetime products than war products.

Steel Capacity

The steel industry states that during the war steel production was at full capacity, in normal times about 65 per cent production is the best rate feasible. Also, steel ingot capacity is now rated at 91,900,000 tons, only 10 million tons above 1940 figures. Something like 3 million tons of bessemer and electric furnace capacity will stand idle in 1947 because costs to operate are too high or demand for special steels is limited. And steel producers point out that of the 7 million tons capacity of government owned war-time facilities less than one half has been sold. These and other deductions bring the 1947 capacity to under 86 million tons. Also to the point, is the fact that in 1946 shortages of coke and scrap and freight cars have been holding operating capacity to under 85 per cent of capacity—and this may continue in 1947.

All of the above figures are in terms of ingot capacity. When waste and scrap are deducted, the 83 million ingot tons of current production becomes only 60 million tons of finished steel products. The 1941 finished products production was 62 million tons.

Light Gauge Sheet

Our industry is concerned primarily with the supply of light gauge material. The picture here is not identified with steel production as a whole. Capacity for sheet production is perhaps 10 per cent above 1941. But announced programs by manufacturers of automobiles, refrigerators, containers, etc., are at least 30 per cent above their 1941 consumption. Tonnage-wise, production of light flat rolled products in 1941 was 21 million tons—American Iron and Steel Institute has just announced current capacity at 23 million tons. Demand is given as roughly 26 million tons as follows: black and tin plate—4½ million tons; galvanized—2 million tons; automobile and truck—8 million tons; construction—2 million tons; containers—1½ million tons; export—2½ million tons; all others—5½ million tons.

Historically, the steel business has been a boom and bust proposition. Steel producers, naturally, hesitate to launch an expansion program when figures show a rough balance may be reached sometime in 1947. Steel says only once in peacetime has consumption come within 12 million tons of present capacity and only three times in history has peacetime consumption topped 40 million tons. In 1946 and probably in 1947, steel's effort will be to increase finishing capacity—and this is certainly what our industry needs. If steel is guessing wrong and consumption does reach a sustained higher level it will be too late to do anything about it for the next two or three years.

Aluminum

In the face of the steel shortage explained above, important and perhaps far reaching development began in 1946 and seems likely to continue—the use of aluminum in heating and sheet metal work. The development is clearly presented in this January issue in the article describing the use of aluminum. In addition to use in heating systems, our industry is using aluminum in ventilating and air conditioning systems, in a variety of architectural metal applications, for all sorts of products formerly made of steel. In general, aluminum is showing a good record.

If aluminum is practical, what is its production situation? Unlike steel, most of the government-built and operated aluminum production capacity was sold to private companies and is already largely in production. CPA recently estimated that aluminum production in 1946 was about 836 million pounds. This is three times 1938. This is only two thirds of the rated capacity which should soon be 1¼ billion pounds.

As shown in the Minneapolis story, price of aluminum has

Year and Month 1946	Total	Warm Air Furnaces—(Number of Units)				
		Solid Fuel		Oil	Gas	
		Cast Iron	Steel		Cast Iron	Steel
January	37,789	7,610	17,545	3,312	2,055	7,267
February	39,664	11,539	14,926	3,115	2,066	8,018
March	47,100	10,690	16,471	4,105	2,189	13,645
April	43,186	11,025	15,173	3,398	2,187	11,403
May	47,321	12,920	13,859	4,766	2,447	13,329
June	49,337	13,537	15,746	4,140	3,239	12,675
July	48,912	11,894	15,666	5,146	2,839	13,367
August	61,927	15,176	20,456	6,079	3,676	16,540
September	71,809	14,396	25,632	8,842	3,917	19,022
Total (9 months)	447,045	108,787	155,474	42,903	24,615	115,266

decreased about 25 per cent since 1941 and now is about 22, 23, 24 cents per pound in coils. With aluminum weighing only one third as much as steel, this is comparable to steel at 8 cents per pound or slightly less.

Furnaces

Figures based upon definite reports for nine months, by types of warm air furnaces, indicate a steadily increasing production. To these figures, shown in the Table, can be added a total production (not broken down by types) for the month of October of 82,800 to make a total for ten months of 529,845. Manufacturers declare the production in November and December will be at least as large as October, so production for 1946 should be about 700,000 furnaces of all types.

This greatly exceeds the total production for 1945 of 372,974 furnaces of all types and exceeds the industry's previous biggest pre-war year—1925 of 511,000 furnaces of all types or the biggest war year—1941 with 517,610 units.

There are in the figures in the Table some comparisons of interest. For example, production of gas-fired steel and cast iron furnaces for 9 months of 1946 totalled 139,881 while production of the same types of furnaces in 1945 was only 52,441 for the whole year. This bears out the statement made elsewhere in this issue that demand for gas heating was indeed phenomenal in 1946. Somewhat the same increase shows in oil fired furnaces — 42,903 units in the first 9 months of 1946 as against 18,605 in the whole of 1945.

The figures seem to show that production of coal-fired units, both steel and cast iron, will be just about the same in 1946 as in 1945.

National Housing Agency forecast, in November, a balance between furnace production and demand about the middle of 1947. At the same time Civilian Production Agency declared 691,000 furnaces would be needed in 1946 and 806,000 in 1947. VHP stated, about the same time, that at least 480,000 furnaces would be required in 1947 for veteran housing.

Motors

Tough bottleneck developing in 1946 was fractional horsepower motors required for blowers, oil burners, stokers, air conditioning units, etc. During the war about 90 per cent of motor production went into weapons — but these motors were d.c. instead of a.c. and of special light weight materials or lightened construction. Manufacturers turned in a splendid war record but with the coming of peace were flooded with orders even before conversion was under way.

As a result, unfilled orders jumped from 5½ million during the first part of 1945 to more than 11 million at the end of 1945 and by October, 1946 had reached the gigantic total of 40 million motors ordered but not produced.

Until far into 1947, the motor manufacturers predict that total monthly production cannot exceed 2 million motors per month and orders for at least that number are being placed every month. How that 40 million backlog can be whittled remains the insoluble problem of 1947.

Controls

There will be increased production facilities available to make controls in 1947 as plants now being equipped and staffed open operations. In 1946, despite many difficulties of production, despite serious shortages of many critical materials, despite labor scarcities, more controls were produced than ever before in the industry's history.

As a whole, the control industry made little progress in reducing its backlog of orders during 1946. The control industry actually enters 1947 with the equivalent of one full year's production now on its books.

With automatic heating gaining popularity month by month, the demand for controls will increase in like proportion. The outlook for control plentifullness in 1947 is, therefore, not greatly different than in 1946.

Oil Burners

In 1945, according to figures of the Bureau of Census, the manufacturers of mechanically operated oil burners shipped 182,130 units of various types. In the first six months of 1946 production reached 187,795 burners. Then production began to climb and in October (the last month reported) reached 73,873 burners. The production for the full year of 1946 should, then, be about 400,000 burners.

This sounds favorable, until the backlog of orders on hand is examined — as of November there were 956,966 burners on order and not manufactured.

The industry's best pre-war year was 330,000 burners, so production in 1946 exceeds pre-war but demand from buyers

(Continued on Page 242)

TAX CALENDAR

Prepare a Tax Calendar similar to this covering Federal, state and local laws. The dates on which Federal returns and taxes are due are the same for all states, but these dates differ on state and local taxes so get the correct information for your state and locality and make proper listings.

Jan. 15—Pay final installment of 1946 tax.

Final opportunity to amend 1946 estimated tax return.

Or file final return on Form W-2 or Form 1040 and pay tax due.

File first declaration, if, for any reason, a 1946 declaration has not been previously filed.

Jan. 31—Give each employe original and duplicate copy of Form W-2, showing total wages paid and amount of income tax withheld in 1946. Retain third copy (Form W-2a) to be filed for 1946 with reconciliation Form W-3 upon which quarterly returns on Form W-1 are reconciled with total deductions from wages.

Make quarterly return on Form W-1 for last quarter ending December 31, 1946.

Make quarterly return under Federal Insurance Contribution Act on Form SS 1-a.

Make quarterly return to state for unemployment compensation.

Make annual return for preceding year on Form 940 under Federal Unemployment Tax Act.

Feb. 10—Deposit January withholdings in depository if more than $100.

Mar. 10—Deposit February withholdings in depository if more than $100.

Mar. 15—File final Federal income tax return for 1946.

File declaration of 1947 estimated income tax and pay first installment.

Apr. 10—Deposit March withholdings in depository if more than $100.

Apr. 30—File quarterly return for first quarter on Form W-1.

Make quarterly return on Form SS 1-a.

Make quarterly return to state for unemployment compensation.

*File state income tax return.

*File sales tax return.

*Pay property taxes.

May 10—Deposit April withholdings in depository if more than $100.

June 10—Deposit May withholdings in depository if more than $100.

June 15—*File general business tax return to city.

Pay second installment of 1946 estimated tax.

File an amended declaration, if necessary.

July 10—Deposit June withholdings in depository if more than $100.

July 31—Make quarterly return of tax withholdings for second quarter (Form W-1).

Make quarterly return on Form SS 1-a.

Make quarterly return to state for unemployment compensation.

Aug. 10—Deposit July withholdings in depository if more than $100.

Sept. 10—Deposit August withholdings in depository if more than $100.

Sept. 15—Pay third installment of 1946 estimated tax.

File amended declaration if necessary.

Oct. 10—Deposit September withholdings in depository if more than $100.

Oct. 31—Make quarterly return for third quarter on Form W-1.

Make quarterly return on Form SS 1-a.

Make quarterly return to state for unemployment compensation.

Nov. 10—Deposit October withholdings in depository if more than $100.

Dec. 10—Deposit November withholdings in depository if more than $100.

Dates shown are accurate for Federal income tax return but items marked with (*) may vary with the state and municipality. In preparing a tax calendar, make listings in accordance with the dates specified in local regulations.

Get returns, reports and payments in as early as possible before due dates.

Change listings to comply with new laws.

Leave blank lines on calendar to insert new listings that may materialize during the year.

Withholdings for last month in quarter may be sent direct to Collector with the two depository slips or receipts for the first two months in quarter, if desired.

Errors in a preceding quarter should be adjusted in the succeeding quarter and a statement attached giving all details.

THE TAX PICTURE—1947

By

Arthur N. Roberts

MORE than likely taxes will be cut in 1947. The newspapers report that individual taxes will be reduced 10 to 20 per cent. After increasing taxes for years, a downward trend looks good to the taxpayers but they must not accept the shadow for the substance. Everyone should fight for much more than a comparatively small decrease from the abnormally high rates in existence today.

One of the weaknesses in the tax picture is the supine acceptance of the public, including the businessman, of whatever tax burden is imposed on them. Even with a 20 per cent deduction on individual taxes and a decrease in corporation taxes, the toll is far above prewar levies and the deficit is $262 billions as of October 1946, only ½ billion under the deficit in November 1945. The deficit must be reduced far more than this in one year to put the government's business in good financial shape.

This means that annual expenditures must be cut sharply, otherwise, if the budget is maintained at or around wartime high and merely balanced year to year, there will be no debt deduction worthwhile. The taxpayer can expect to pay high taxes for years unless the annual budget is reduced to a substantial degree and this is the thing to bear in mind and bring forcibly to the attention of representatives.

Hordes of bureaucrats clog government payrolls and they are loathe to leave. In the past, when one agency closed up, the incumbents got jobs with another agency and although this trek has been somewhat abated, it still goes on to an unwholesome degree. Regardless of what party ascends to power, there is a tendency to make jobs for the faithful and the machinery is all set to give more abundantly along these lines than ever before. This is the evil that taxpayers must combat, everyone, regardless of party affiliations, if taxes are to be levied in reasonable proportion to income and profit.

Volume High, Profit Low

At this time, business is not hard to get if one has salable material. In general, barring strikes, production has maintained a steady pace. Shortages have been troublesome, and closed up some plants, but, in the over-all picture, over the past five years, there have been fewer lay-offs than in prewar years. Shut-downs and recessions levy a tax that often is more burdensome than income taxes. Businessmen have been able to pay high taxes without going to the wall because of continuous operation. The overhead cost per unit of production in ratio to sales has been lower than in prewar years, *much* lower in some plants. High in dollars and cents, but, lower in ratio to sales. This applies to many mercantile establishments too. It will be different when sales drop or when a buyer's market comes to town. Then the trend will be toward an increasing cost per unit of production in ratio to sales, not only because production may not be as high, but because advertising, selling and collection expense will increase sharply. Then too, plants may shut down for short periods because of business drought. If the businessman must stand additional levies and pay topflight taxes, the wallet will buckle.

During the war, advertising, selling and collection expense was practically nil for many businessmen because business fell into their laps, money was sure-pay. Customers had good jobs, made good money, and were glad to pass it over the counter for hard-to-get merchandise. In some cases, the outlay for these expense items runs more than 15 per cent of sales, so this meant 15 per cent more profit, out of which the government took a substantial cut, but the taxpayers still had something left over plus their net profit on operations. Now these outlays come back to the books again, the taxpayer has no "cushion" to absorb the brunt of high taxes, he must pay out of a shrinking net, and it will press many to dig up the wherewithal. Even during the war, some businessmen had to borrow to pay taxes, a very unwholesome practise which will be accelerated in the postwar period unless government expenditures are reduced sharply.

This is not complete pessimism. Inventories of soft goods are increasing fast. Hard goods are expected to meet demand in middle 1947. Add to these facts, the fantastic output that is inherent in our industrial machinery, born of war stimulus, and the buyer's market is not so far off. A buyer's market and wartime expenditures cannot sleep comfortably in the same bed.

Can Budget Be Balanced?

We hear much about balancing the budget, but when one analyzes the figures, one finds that government expenditures are increasing because the government is up against higher costs too, it pays more to get less, so even though the budget is balanced in 1947 and national income is in the stratosphere, the taxes collected in 1947 will be just about enough to allow the government to break even on annual expenses with little or nothing left over to reduce the deficit. Then too, the soldiers will be taken care of, as is fitting, but this takes money and means that thousands of employes on the government payroll should be sent back to the factory.

This is a serious situation and has many angles. We can review only the high spots and depend upon the intelligence of the reader to follow through. Taxes are abnormally high for normal peacetime operation. The taxpayer would have been aghast at current taxes in the prewar days and unless he reverts to this attitude, prewar volume or profits may come back to haunt him sooner than expected and tax expense will be a crushing burden. Taxes will not be reduced to make the going safe for businessmen unless government

outlay is drastically cut and unless businessmen crusade for lower taxes, it isn't likely that much will be done. An occasional reduction for political purposes is not the solution because if expenditures are kept high and tax revenue doesn't cover government outlay, the shortage is added to the deficit and the merry-go-round never stops.

The foregoing offers the best counsel we can give readers at this time. We could advise anent the best procedures to follow in order to obtain tax economies but this will be of little avail if the rates keep up around the Milky Way. Use every means at your power through trade associations, letters to Congressmen and other contacts to reduce government expenditures, so that the present high tax rates can be decreased substantially.

Set Tax Aside!

Next in importance, is a close scrutiny of tax from the beginning of the year. Set aside monthly the tentative tax and enter it in your books as an accrued liability, deducting this expense from the net profit to arrive at your pocket-profit. Many businessmen in the lower brackets do not do this and it distorts the picture of earnings. You can't spend your tax and the government wants it in cash on the due-date. If the high progressive tax rate remains the same, the taxpayer should watch sales because as income increases, the tax increases and cuts more deeply into profits. Review the problem accounts, such as depreciation, bad debts and inventory, to make sure you are getting all the deductions to which you are entitled. It is harder to keep such accounts accurate, because, unlike wages paid or light and phone expense, they involve an element of estimate, hence, the necessity for extra care.

As 1947 begins, take time to review your status as soon as possible. Do not wait until the year is over or until around filing time on March 15. Then it may be too late to effect deductions because the year has passed, the transactions have been concluded and booked, and, if the handling of these factors preclude a tax deduction, nothing can be done about it after the year is history. That is why it is wise to preview your tax return at the end of each year so that adjustments may be made before the books are closed.

• • •

TREASURY ALLOWS INCREASED DEPRECIATION

OWNERS of long-life business property and machinery have been handed a way of increasing depreciation rates. According to Research Institute of America, the Treasury Department recent ruling that single or multi-family rental houses can be depreciated under the "declining balance method" was intended to act as an incentive for new building. But Treasury officials have said that all owners of *existing* depreciable buildings whether used for housing or business purposes, may *change* to this method.

The "declining balance method" yields additional depreciation in the early years—as much as 50% more in the first year. Commissioner's consent will have to be obtained, but the only real question will be agreement as to the remaining life span of the property.

How to Figure Depreciation

Instead of a constant depreciation amount each year, the "declining balance method" gives the largest deduction in the first year and progressively smaller ones in each succeeding year. Reason is that the rate is applied to the *declining balances* rather than to the cost. (Cost is used as the base in the straight-line method.)

The depreciation rate applied to the declining balances is arrived at by a standard accounting formula. Under this formula the rates are often 200%-300% of the regular straight-line rate. But the Treasury will not permit that high an increase. It holds that the *rate cannot exceed 150% of the usual straight-line rate.*

Practical effect is that you use 150% of your regular straight-line rate but apply the rate to an ever-decreasing amount—cost less depreciation already allowed.

Example

Assuming that a machine cost $7,000, has a life of 7 years and salvage value of $700, here is how the two methods compare:

Year	*Straight-Line*	*Declining Balance (With 150% limit)*
1	$ 900	$1,500.03
2	900	1,178.59
3	900	926.03
4	900	727.59
5	900	571.67
6	900	449.17
7	900	352.92
	$6,300	$5,706.00

Here are the advantages and disadvantages of the declining balance method as allowed by the Commissioner—that is, with the 150% limitation.

1. *Advantages.* For the early years of an asset, depreciation is considerably higher than that allowed under the straight-line basis. If the asset is sold after a few years, you get the full benefit of the higher depreciation while any gain will be taxed as a capital gain. The new owner can change to a straight-line basis or can start the declining balance method afresh. If you don't sell, and tax rates go down in future years, you have had the benefit of greater depreciation against higher rates.

2. *Disadvantages.* High early depreciations are more than offset by lower rates in later years. There will be an undepreciated balance left in the last year of the asset's life. This will have to be deducted at that time—if the asset has no further useful life. If the asset continues to be used, depreciation continues.

Thus, the declining balance isn't *always advisable.* But it

(Continued on Page 258)

How To Reduce Payroll Taxes Under Merit Rating* [Part 2]

IN many situations, *only* the employer can prevent a worker from collecting benefits to which he is not entitled. In these cases, only the employer possesses the facts to refute an unjustifiable claim.

The average employee will apply for unemployment benefits automatically upon separation from his job, regardless of the circumstances. His attitude, as expressed over and over again to the state agencies, is that he is not working and should get benefits because "that's what they're there for". **Most workers don't realize that benefits are not a separation bonus, but are provided only for persons who are unemployed *through no fault of their own* and who *want to work*.**

This widespread misunderstanding of the law places the burden on the employer. *If the employer doesn't take the proper steps, the worker will be paid benefits simply because the state agency doesn't know the facts.*

"Disqualifications"

To prevent the payment of benefits to persons whose unemployment is their own fault, the law provides for "disqualification" from benefits under certain circumstances—as when claimants leave work voluntarily, are discharged for misconduct, etc. It is through enforcement of these penalty provisions that the employer may achieve a low merit rate.

Types of Disqualification

The specific disqualifications of each state are shown in the table which follows. They fall into four main groups:

1. *Total disqualification.* Before drawing benefits, the ex-worker must get a new job, lose that, and show eligibility for benefits. If he remains unemployed for an appreciable time, or finds a new job which he either retains or leaves under disqualifying circumstances, it may be that benefits will *never* be charged against your account.

2. *Postponement of benefits.* Payment of benefits is suspended for a certain number of weeks. This waiting period increases the possibility of locating a job before the claimant again becomes eligible for benefits—thus obviously reducing the chances that benefits will be drawn and charged against your account.

3. *Reduction of benefits.* The duration of benefits is shortened. Thus, charges made against your account are potentially less than if the disqualification had not been imposed.

4. *Cancellation of wage credits.* Wage credits earned with you are cancelled, or it is provided that any benefits which are paid cannot become benefit charges against your account. In such cases, you will not be charged with *any* benefits.

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How to Reduce Charges

Some person should be made responsible for checking and keeping up to date on claimants' eligibility for benefits. This individual should interview each employee leaving and make a record of the interview, noting any facts which will bear on the worker's eligibility for benefits, such as the state of his health, what he intends to do after termination, etc.

A record should be kept of the facts showing the reason for termination. In cases of disqualification, the employer's position will be strengthened if he has the employee sign a statement indicating the reason for his separation. This might be obtained by showing the record to the employee and suggesting: "If you disagree, write in your own statement; if it's correct, please okay it."

Use a "disqualification record." Go even further and add to the termination record a "disqualification record," which shows whether or not the employee is separating under circumstances which disqualify him for unemployment benefits. Note on the termination form whether or not disqualification should be imposed.

If the separating employee later files a claim for benefits, the employer will receive a notice from the agency. If a claim is allowed despite the fact that the situation indicates disqualification, *the employer is on notice to appeal the decision.* If no disqualification is involved and reemployment is recommended, add the person's name to a list of former workers now drawing benefits, to be considered for rehiring as soon as possible.

All states require information from the employer—on the eligibility of a terminating employee—either automatically at separation or on request when a claim is filed. In disqualifying instances, *be sure to return this notice within the time specified.* Failure to do so means, in most states, that the employer forfeits his right to any later appeal.

On this separation notice, don't just state the general category—"voluntary leaving", "misconduct", etc. *Give the details* on which the disqualification claim is based.

Contest Adverse Rulings

In a sample period, approximately one-third of employers' appeals were successful. The notice of the agency's decision will show the limit within which an appeal must be filed. On appeal, there will be a hearing of both sides at which both sides must be represented. Legal counsel is not necessary—any person familiar with the facts will do. In these hearings, the admissibility of evidence is governed by informal administrative rules, rather than by strict court procedure. The final decision of the administrative agency can be further appealed to the courts.

Don't appeal decisions where the facts are *clearly against you.* Not only will you lose the appeal, but your policy may be construed as an anti-employee attitude—potential ammunition for any groups that might want to stir up resentment among your workers.

Disqualification Rules in Various States

(Figures indicate weeks)

State	Waiting period	Voluntary leaving without good cause	Misconduct	Job refusal	Misrepresentation on claim	WORK STOPPAGE LABOR DISPUTE: Period disqualified	No disqualification: If no direct interest	No disqualification: If not in same class of worker	No disqualification: As if in separate business	RECEIPT OF: Wages in lieu of notice	RECEIPT OF: Dismissal pay	RECEIPT OF: Workmens compensation	RECEIPT OF: Old age benefit	Marriage	Pregnancy: Before birth	Pregnancy: After birth	Students
Ala.	1	Total[1]	3-6[2]	Total[3]	8-52	Duration of dispute[4]	....[4a]	.....	.....	√[4b]	√	√	√	.....	12	12	√
Ariz.	1	4[5]	4[5]	1-5	....[4a]	Duration of dispute[4]	√[4b]	√	√	.....	.....	.....	√	.....	.....	.....	.....
Ark.	1	1-5	1-5	1-5	1-20	Duration of dispute[6]	√[4b]	√	√	....[4a]	.....	.....	√	.....	.....	.....	.....
Cal.	1	1-4	1-4	1-4	1-4	Duration of dispute[7]	....[4a][8]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colo.	2	3-15[9]	3-15[9]	3-15[9]	....[4a]	Duration of dispute	√[4b]	√	√	√	.....	√	.....	.....	.....	.....	.....
Conn.	1	4[9]	4[10]	4[11]	....[4a]	Duration of dispute[4]	√[4b]	√	.....	√	√	√	.....	.....	8	8	√
Del.	1	Total[12]	Total[12]	Total	52	Duration of dispute	....[4a]	.....	.....	.....	.....	.....	√[4b]	.....	.....	.....	.....
D. C.	1	3	1-4	3	....[4a]	Duration of dispute[4]	√[4b]	√	√	.....	.....	.....	.....	.....	.....	.....	.....
Fla.	1	1-12[13]	1-12[13]	1-5[3]	52	Duration of dispute[4]	√[4b]	√	√	√	....[4a]	√	√	.....	.....	.....	.....
Ga.	2	2-8[5]	3-10[3]	2-8[3]	....[4a]	Duration of dispute	√[4b]	√	√	√	.....	√	√	.....	.....	.....	.....
Ida.	2	Total[14]	Total	1-5[3]	1-52[3]	Duration of dispute[4]	√[4b]	√	√	....[4a]	√	.....	.....	.....	.....	.....	√
Ill.	1	3-7	3-7[16]	3-7	....[4a]	Duration of dispute	√[4b]	√	√	.....	.....	√	.....	.....	.....	.....	.....
Ind.	1	5[3]	5[17]	5[3]	Total[18]	Duration of dispute	√[4b]	√	√	....[4a]	√	.....	√	√	Dur.	.....	.....
Ia.	2	Total[19]	2-9[3]	Total	....[4a]	Duration of dispute	√[4b]	√	√	√	.....	√	√	.....	.....	.....	.....
Kansas	1	1-9	1-9[20]	1-9	....[4a]	Duration of dispute	√[4b]	√	√	.....	.....	.....	√	.....	.....	.....	.....
Ky.	1	1-16[3]	1-16[3]	1-16[3]	1-16[3]	Duration of dispute[4]	√[4b]	√	....[4a]	√	.....	√	√	.....	.....	.....	.....
La.	1	1-6	1-6	1-6	....[4a]	Duration of dispute	√[4b]	.....	√	.....	.....	.....	.....	.....	.....	.....	.....
Me.	1	1-5[21]	1-9[21]	1-5[21]	Dur.[3]	Duration of dispute	√[4b]	√	√	√	√	√	....[4a]	.....	.....	.....	.....
Md.	0	1-9	1-9	1-9	1-52[22]	Duration of dispute	√[4b]	√	√	....[4a]	.....	.....	.....	.....	8	8	.....
Mass.	1	Total[14]	Total[23]	1-4[3]	1-10	Duration of dispute	√[4b]	√	√	√	....[4a]	√	.....	.....	4	4[12]	.....
Mich.	1	Total[14]	Total[24]	3-5[3]	3-5[3]	Duration of dispute	√[4b]	....[4a]	....[25]	√	.....	√	√	√	Dur.	.....	.....
Minn.	2	3-7[26]	3-7[27]	3	1-52	Duration of dispute[4]	....[4a]	.....	.....	√[4b]	√	√	√	√[28]	Total[13]		.....
Miss.	2	1-12	1-12	1-12	1-16[3]	Duration of dispute	√[4b]	√	√	....[4a]	.....	.....	.....	.....	.....	.....	.....
Mo.	1	1-4[3]	1-8[3]	4-8[3]	Total[18]	Duration of dispute	√[4b]	√	√	√	√	√	√	.....	.....	.....	.....
Mont.	2	1-5	1-9	1-5	....[4a]	Duration of dispute[6]	√[4b]	√	√	√	√	√	√	√	.....	.....	√
Neb.	2	1-5	1-5[29]	Total	....[4a]	Duration of dispute	√[4b]	√	√	√	√	√	√	√	12	4	√
Nev.	1	1-15	1-15	1-15	52	Duration of dispute[4]	√[4b]	√	√	....[4a]	.....	.....	.....	√	.....	.....	√
N. H.	1	Total[30]	3[31]	3	52	Duration of dispute[32]	√[4b]	√	√	√	√	√	√	.....	8	1-8[11]	.....
N. J.	1	3	3	3	....[4a]	Duration of dispute	√[4b]	√	√	√	.....	.....	.....	.....	.....	.....	.....
N. M.	1	1-13[3]	1-13[3]	1-13[3]	....[4a]	Duration of dispute	√[4b]	√	√	.....	.....	.....	√	.....	.....	.....	.....
N. Y.	1	6[33]	7	Total	5-20[3]	7[7]	....[4a]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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Arnold Kruckman's

Washington Letter

AGENDA FOR 1947

THE Weather Bureau issued a statement the last Sunday of 1946 in which it warned that two mild years seldom come together, therefore we must make up our minds to expect weather in 1947 a lot worse than the mild weather of 1946. Said Chief Tannehill of Mr. Harriman's Weather Service: "We are absolutely confident that 1947 will be a bad year." Without going into the whys and wherefores of Chief Tannehill's gloom, the thought arises that conditions would be more lucid in the United States if others were as certain of the future of *other* affairs as Tannehill is about our prospective climate. The usual reaction you get about the months ahead is that the probability of war has dwindled; but when you consult those who have recently returned from Europe or Asia you find that they are convinced the world is deliberately going ahead about the business of adjusting itself to the inevitable conflict that *will* break, possibly within ten years. Off the record, there are military folk in the United States who cut the limit down to 5 years.

The New Budget

If you wish to gauge the pulse of Washington, watch the rising beat of the drums which supply the cadence for the march towards a greater national defense program. Not long ago the proponents of a lower budget set the 1947-48 needs for War, Navy, and war agencies and war activities at $18,978,000,000. Early in December the Government budget experts flatly pointed out we could not adequately prepare a national defense for less than $36,000,000,000 next fiscal year; and now it is said that we may need a sum nearer $40,000,000,000—possibly even higher. The point is that the national defense, and the cost of national defense, unquestionably will come to the front in the new Congress as the chief subject of national concern. When you survey the ferment in the world, and become actively conscious of the turmoil in various parts of the globe, you cannot sidestep a sense of the need for a strong and thoroughly prepared national defense. And that leads to the unavoidable thought that we are almost irrevocably headed towards another economy based largely upon the prospect of war, or an actual state of war.

A Return to Regimentation

That consideration, in turn, leaves you no option but to give thought to the fact that an economy based on war brings with it the regimentation, the restrictions, and the constrictions, that must follow either war preparations, or war. Here again you run into the puzzle as to whether we will soon go back to that political state which is natural to these United States, i. e., a State which is the servant of the people, or whether we will again be forced, by the developing circumstances, to accept a State in which the individual is subordinate to the State. It is a tough problem, because there can be no remote doubt that we must be strongly prepared; the great unknown quantity we probably will have to solve is how we may go through the mechanics of preparing our defense, and how we may have compulsory universal military service with a massive army and navy, without surrendering our right to keep the State as our servant rather than to let the State subordinate us. Apparently what some one, or some group of patriotic minds must solve, is how to establish and maintain the absolutely essential, strong and numerically great military organization and still keep that organization subordinate to the civilian economy. These are problems that are not simply around the corner, they are practically here; and the politicos, now in the seats of power, with nervous eyes and ears trained on the prospects of 1948, are jittery about the potential open discussions which will come up in Congress, and flare around the country. Many of them realize that only a few of the millions in the United States have actually thought about these problems, probably do not clearly realize there are such immediate problems.

A Conflict of Philosophies

There is much speculation here about the manner in which various elements will be aligned. The great integrations of industry are not assumed to be deliberately in favor of a State which is the master of the individual, in the European or Asiatic sense; but there is much sentiment abroad that

these groups sincerely hold that the greater integrations are more capable of planning the economics of the country than the people of Smaller Business. It is generally held in Washington that the men and women who guide the destinies of the great Labor Unions, have the same thought about the politics of economics as do those who head the great industrial integrations. The third group, the radicals, look upon the whole business as a social problem, and sincerely and frankly hope that the State will be the master in order that the distribution of economic benefits and social privileges may be directed by the State to level off what they consider inequities. All these groups are powerful, but are minorities with the advantage of efficient organizations. The people of smaller business, in the smaller communities, who are the old-line Americans, with faith in that essence we call Democracy, are the disciplined individualists, and are vastly in the majority, but have found no common denominator by which they may make their collective thought felt in an organized manner. They apparently look to Congress as their clearing house, and Congress is unhappily aware that it must steer its way through this Scylla and Charybdis. It therefore seems to be the cue for the business man out through the country to keep a sharp eye on the meaning of the drift of the actions of the Congress.

Current Trend in Europe

It is important for the business man to understand that representatives of management and labor, who recently attended the Conference of International Labor Organization in Europe found, to their amazement, that either Communism or a very radical Socialism is the dominant thought of both management and workers, over there; and the Americans were bewildered to discover that European management and workers do not think in terms of creating, through industry, new assets and commodities and services, by using initiative and materials, but devote their thoughts to exploration of methods by which they may *share* their resources. One American member of the Conference, who represented the building industry of the United States, reports that all Europe looked to our country as the other great global force which must carry the burden of all troubles connected with supplies, finances, and planning, as opposed to the ideology represented by the Soviets. The same person reported the representative from India spoke for an hour and a half, and when the interpreter arose he said in eight minutes what the Indian had in mind, namely, that the next World War already has actually started in Asia, that the Asiatics, *a billion strong,* had begun to march with their allies to rid the Orient of Western dominance. The American stressed that the age-old authority of the British very obviously is no longer a controlling factor in the thought of either Europe or Asia. Europe, generally, accepts the Russian as the master of Europe. The American found the British in their homeland were much more tightly limited in food and clothes and all other supplies for daily life than any other people across the Atlantic. He emphasized that the Scandinavians were practically the only people in Europe who still kept the faith according to the individualistic philosophy of democracy, and were not carried away by the tendency to expect the world to share on the basis of collectivism. He was very deeply impressed by the clear and cool independence of the Finns, who seem tenaciously to cling to their individualism despite the pressure from their gigantic Russian neighbor. He had an extraordinary admiration for the small nation on the Baltic, but little respect for the peoples on the Mediterranean.

The Fruits of Victory

It is interesting to learn that there was an absence of bitterness towards former enemies in Central Europe, the feeling apparently being they were all in the same dreary circumstances of poverty and submission. He found that building and construction is proceeding very slowly and very wearily, despite American supplies, and despite the visible evidences of stupendous destruction. He found the French peasant particularly bitter about the annihilation of his barns and his homes, usually age-old structures, and the peasant seemed to think his former Allies, especially the Americans, should provide the materials and the means to replace what was destroyed. He knew the Germans could do nothing about it, and his ill-will towards the Allies was therefore aggravated. This American observer felt that the greatest lack in Europe is both materials and efficient manpower.

Controls Nearly Extinct

The people in the Capital point out that there are almost no controls left to interfere with American production. It is generally assumed the Office of Temporary Controls, successor to CPA, will do something about the remaining controls on building materials immediately after Congress convenes. Almost all types of merchandise are expected to flow from the factories early in 1947, of better quality as well as greater quantity. Prices are expected to drop to reasonable levels. It is especially interesting to learn from former CPA Administrator Jack Small that he is utterly convinced uncontrolled building and construction is practically here, and will be transformed into a stupendous activity. He pointed out that during its closing days the CPA refused to sanction 1,300,000 non-housing projects, and that each of these proposed projects represent a potential investment of a minimum of $15,000, or a total of $19,500,000,000 worth of construction and building. Small urged that any such stupendous backlog of business, waiting to go ahead just as soon as is feasible, must cancel those fears of depression and hard times. Such controls and priorities as remain will operate to feed 100% steel and other materials, equipment, and facilities, to the housing program, and that the rest of the construction and building industries will receive approximately 85% of the supplies they need. It is one of the fine things in recent experience that the report finally issued on housing by the American Legion comes out flatly for a program by which housing materials and facilities would be shared by the veterans—who have legal preference with non-veterans who have families including children and dependent women, and who are in much distress for shelter. The discussion about the housing also has brought out the fact that the recent billion dollar increase in freight rates will add from $6 to $16 for lumber used in a new house; and that added costs to the present prices of furnaces, plumbing, hardware, building board, and other manufactured supplies, will be substantial.

The Labor Picture

The most vociferous immediate debate in the new Congress should be about labor and labor legislation. You may think from what you have read that much will be done. Apparently the Republican leaders plan to let the new Senators talk their heads off, and then to divert the whole business into a blind alley. The betting is that no sweeping anti-labor legislation will be enacted. There is much fear that by some acci-

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Schmidlin's — Adjusts Itself to Circumstances

SAID Grove Patterson (a columnist) in his "Way of the World" in a recent Toledo, Ohio, newspaper—"We have been told so often by newspaper writers, economists and so-called experts that we are living in difficult times that we ought to know it by this time. We have been up against shortages and high prices and all that sort of thing for a long time, but still we make a poor job of adjusting ourselves to circumstances. If we are not to be constantly miserable, we shall let that sort of thing go as water under the bridge and save our temper and our blood pressure by not stewing about it. When our great-grandfathers missed the stagecoach they sat down in the inn for a couple of days wait—now we go up in the air and suffer acute frustration if we miss the first section of a revolving door."

Of course, every employer in this business is adjusting himself to the problems of the moment, but some contractors are doing a much better job of adjusting than are others. Take the case of Schmidlin Bros. of Toledo—hundreds of persons in the industry know Dan and Carl Schmidlin and their firm as aggressive, up-on-its-toes and willing to try anything if an idea seems to have merit. Just to cite history—Schmidlin went all out for forced warm air heating when the local industry was still talking gravity; Schmidlin organized furnace cleaning into a big-time operation when most contractors were content to clean a couple of dozen furnaces a year; Schmidlin began advertising the merits of insulation even before the insulation business got started as a separate operation; Schmidlin has been selling conversion oil burners, conversion gas burners, stokers, for so long that many Toledo home owners know the firm by its specialty sales rather than as a furnace organization.

Thousands of Furnaces

To bring these activities down to cases—up to the end of July, 1946, Schmidlin Bros. had installed in Toledo 9,317 warm air furnaces. In 1945, the firm serviced—in the summer—more than 3,000 furnace installations (cleaning, repair) and in 1946 boosted this total to almost 4,000 service jobs. And the firm carries on its books more than 3,500 customers who expect Schmidlin to do their summer service.

Translated into dollars and cents sales, here are figures on three Schmidlin "side-lines" for the first nine months of 1946—oil burner sales $142,000 and oil burner service, $15,000; stoker sales, $9,000; insulation sales, $11,000. In the same period furnace repairs and service, exclusive of the firing device, totalled $24,000; furnace and air conditioner sales $112,000.

How this volume was maintained is an interesting story of "adjusting yourself" in the face of shortages of almost all the "little" things which make service possible. For instance, small motors. Forced air furnaces and blowers were received without motors. To make sales, motors were required so Schmidlin's service men were instructed to ask every housewife whose basement they visited—"Do you have any small motors lying around you're not using?" Old motors were turned up at the rate of four to six a day. Not all were usable, but practically all were usable or repairable. Further, salesmen, calling on Schmidlin were asked to inquire at all stores, factories, etc., they might visit and these salesmen turned in scores of motors. Prices paid averaged about $8 to $10, and many were then rebuilt.

Or, take BX and conduit, fittings and copper tubing—service men and salesmen visited hardware stores, service stations, etc., and picked up every fitting found—several bushels of such fittings were thus obtained. Meanwhile Schmidlin telephone operators and phone canvassers were instructed to ask everybody who called if they had any motors—many were so discovered. And quite a few sales were made where the owner furnished the motor from an old washing machine or the man-of-the-house's workshop tools. Most motors so found were sent to the burner manufacturer to remake into a suitable frame.

The same never-say-die spirit also brought in 1¼, 1½, 2-inch pipe needed to hook up oil burner, tanks, etc. Service men bought any pipe clean enough to use. And when fuel oil tanks disappeared, the firm found several lots of black iron and three welding shops which would cut and weld tanks. Schmidlin gets one tank from every 200 to 250 pounds of iron they furnish.

All of these stop-gaps are not going to turn out satisfactorily. Many of the old motors won't stand the strain and will have to be replaced—free, of course—but until such motors do break down the owner will have heat. Last summer the firm tried to buy packaged coal to hand out to oil furnace buyers who could not get a motor.

Conversion Burner Trouble

One last headache bears reporting. Last summer when the Detroit gas company stopped accepting new gas heating, all the conversion gas burner manufacturers and dealers in and about Detroit (and there were dozens of them) descended on Toledo like locusts. Gas conversion burners went in any old way and at any old price. Established Toledo dealers watched their business go to pot over night. City officials were appealed to and reported they could do nothing, because the firms took out a license. Builders were asked to buy from Toledo firms. Finally, the banks and lending companies financing the time payment sales were brought into a meeting and the situation explained. The financing companies agreed not to finance any sale which did not pass a stiff inspection. Thus many, but not all, fly-by-night sales were put under control.

In the midst of such a period—Dan and Carl say it's the toughest in the firm's history—a new office and display room with more than adequate shop space was bought and opened on a thoroughfare which, by traffic count, is one of the busiest in Toledo. The same kind of shortages which plague the firm's own operations also deviled the building contractor. There were no light fixtures, no electric conduit, no wall board for offices and display room, no doors, no furniture—and so on. Everyone in the organization turned detective and eventually all these materials were found—some so close to home it was funny. The photograph of the new Schmidlin establishment shows the result.

The remodeling of office, show room and shop cost at least $20,000—and since labor is the same for a fine job or a half-way job, a fine job was chosen. Dan and Carl believe that the buyer's market will not last forever—when selling days come, the show room will be used to display and demonstrate and convince the prospect that Schmidlin should do the work.

In all things the firm is preparing for this day—the engineering department is getting organized and staffed; the sales staff is being enlarged and trained; the office force is being readied; the shop force is being weeded so that eventually all workmen will be good mechanics.

Everybody Sells at Schmidlin's

But it is on the sales plan that the company pins its hopes for continued progress and profits. About eight salesmen are used. Each man is paid a flat 10 per cent commission and if he can't make $5,000 a year for himself, he gets fired. By advertising and prodding, each salesman is urged to increase the amount of time he actually spends in front of prospects. That's where the sale is made. The firm pays no drawing account but does make "advances" for living expenses based upon the salesman's history of presentations and demonstrations made.

First step in the procedure worked out is a "survey." This is a data sheet on which is given all essential data needed for a price estimate on a complete heating system, a conversion job or remodeling. The engineering department figures an esti-

Above, facing—Exterior of new office, display room and shop on one of Toledo's busiest streets. Schmidlin believes real selling will soon be needed — this building is in preparation.

Right — Interior of new building showing display space — the offices are to the left. The flowers denote Toledo business men's wishes for success.

OFFICE LEDGER COPY

SOLD TO _____ S. B. NO. _____ **Nº 250**

ADDRESS _____ PHONE NO. _____

LOCATION OF JOB _____ UNIT _____ DATE _____ 19

KIND OF WORK _____ MODEL _____ SERIAL NO. _____

DATE PROMISED _____ OIL FURNISHED BY _____

SALESMAN _____ COMMISSION _____ DATE BILLED _____

CONTRACT PRICE AND TERMS _____

INTERESTED IN

New Furnace Yes ☐ No ☐ Thermostat Yes ☐ No ☐

Rockwool Insulation Yes ☐ No ☐

Fill In The Above on Every Cleaning and Repair Job

DATE	MATERIAL ORDERED	DATE	ASSIGNED TO

Two sides of "Order Form" when job is completed, makes a permanent record of every detail of the job. Note rubber stamp which entitles mechanic to $5.00 if work checked is sold.

mate. The salesman takes the survey, the plan, the price and makes a "presentation." To make it worth while to make a survey and a presentation, the salesman is paid a minimum of $5.00 for each survey; $2.50 for each presentation; $2.50 for each demonstration.

Even the mechanics are given an opportunity to make some sales money. On the Order form (in three copies with a spare tissue), a rubber stamp imprints on the yellow copy which goes to the job with the working crew three possible additional sales—(1) new furnace, (2) thermostat, (3) insulation. The mechanics check these with the owner. If the owner signifies an interest in any of this additional work—and if the salesman makes the sale—the workman gets $5.00. This one-minute question, Dan Schmidlin impresses on his mechanics, if religiously followed can return as many as eight sales a week or $40.00 extra pay. And Dan goes to some pains to emphasize that $40.00 a week for this small effort makes fighting for 5 and 10 cents per hour wage increase small potatoes, indeed.

This order form is the end result of several years of experimenting with order forms which save time. The white copy goes into an office file and is kept forever. The tissue stays in the order book—which is also kept—in case the office copy gets lost. The pink sheet goes to the shop superintendent to assign jobs.

The back side of the order form (white copy only) is the material and labor cost record. Keeping these white copies on file maintains a perpetual record of every job of work the company has done.

DATE	HOURS OR QUANTITY	MATERIAL & LABOR COST	PRICE	MATERIAL	LABOR	SELL

LABOR	COST MATERIAL	NO TAX	OHD	MEMO

National Warm Air Heating & Air Conditioning Ass'n

Reports—

A Statement by Frank E. Mehrings, President of the Association, on the Year just Past and the Year to Come

AT no other time in its history has the Warm Air Heating Industry stood on the threshold of greater opportunity than at this time, and the National Warm Air Heating and Air Conditioning Association has currently set out to capitalize this opportunity for the Dealer and Jobber Trade as well as for the manufacturers of furnaces and allied products.

With the advent of World War II, Warm Air Heating and Air Conditioning had reached an all-time high in popularity and certainly it must be admitted even by our contemporaries that "such popularity must be deserved."

The Warm Air Furnace Industry, in the year 1946 according to reports, will surpass all previous production and sales records. As a matter of fact, from January 1 through October 31, 1946, there were shipped 529,337 warm air gravity and winter air conditioning furnaces for all fuels and for central heating systems, and in this connection it should be borne in mind that shipments almost exactly represent sales because of present-day product demands.

The year 1946 started out with shipments of 37,789 furnace units in January, and October shipments had risen to 81,901 furnace units for the month. Therefore, assuming that shipments for November and December (for which months figures are not yet available) average 80,000 units for each month, which seems reasonable to assume, then total shipments for 1946 will be 689,337 as compared to the previous high of 517,000 units in 1941. It will be observed that even at only the current shipping rate, total shipments for 1947 would almost reach 1,000,000 units, but when taking into account the fact that a number of manufacturers in the Industry have not yet reached their full production stride, it is predicted that total shipments for 1947 may reach 1,250,000 furnace units in 1947.

Incidentially, it should also be borne in mind that production and shipment of all other warm air heating products, such as registers and grilles, pipe and fittings, blowers, filters, controls and other accessories, usually follow the production and shipment curve of warm air furnaces.

Not content to rest on its laurels, however, this Association is continuing its program to keep the Warm Air System of heating in the forefront by continued *research* and *education* which have been the prime objectives of the National Warm Air Heating and Air Conditioning Association.

With reference to research, it is to be noted that the year 1946 marked a fresh grip at current problems by disposing of the old Research Residence which was erected in 1918 and has been in constant use ever since, and proceeded with the erection of a new, modern research house where the work can be carried on in an up-to-date manner. The new building—incidentally the first in the new Home Research Center at the University of Illinois—with its completely new equipment and increased staff will be ready for operation early in 1947. Dissemination of the findings is, of course, of prime importance, and this is continuing to be accomplished through the Association's Codes and Manuals, which publications have enjoyed their greatest sale and distribution during the past year; and the presses are humming to turn out more and more to supply the increasing demand.

An entirely new effort in Dealer education has had its beginning during the past year in the Application Engineering Conferences, staged by the National Warm Air Heating and Air Conditioning Association, and which has been so well received that this program is being greatly enlarged upon for 1947, with many more "schools" to be held, not only serving a much larger area but also covering the territory more thoroughly and in a better way by means of modern audio-visual equipment and in other ways, made possible by the funds provided through the Publicity and Merchandising campaign of the past year or two.

Another important adjunct to the Association's activity the past year is the publicity program including consumer literature, newspaper releases and Dealer helps which will be coming more and more into prominence during 1947.

At the forthcoming convention of the National Warm Air Heating and Air Conditioning Association in Cleveland, January 29 and 30, members and guests will have a "preview" of the most ambitious and promising program any association has embarked upon in recent years.

Frank E. Mehrings,
President.

New Sheet Metal Apprentice Standards of The Sheet Metal Workers International Ass'n

The Apprenticeship Committee at The 27th General Convention of The Sheet Metal Workers' International Association, held at Chicago, Illinois, November 11 to 16, 1946, offer this as a Minimum Standard of Apprenticeship training and recommend its use on a national basis.

Foreword

Recognizing that there is no substitute for apprenticeship, there is a definite obligation on the part of the present generation of the sheet metal industry to supply means for young men who will be their successors to obtain training and education to fit them for their responsibilities. Therefore, the Sheet Metal Workers' International Association has resolved to establish trade training for apprentices in accordance with the recommendations of the Federal Committee on Apprenticeship that will provide apprentices in the sheet metal industry with opportunities to attain the efficiency and versatility required for true craftsmanship, that will help immeasurably to raise the level of workmanship for the trade generally and develop the necessary background for good citizenship.

Definitions as herein used . . .

"Committee" means the Local Sheet Metal Joint Apprenticeship Committee.

"Associations" means the Sheet Metal Contractors' and Sheet Metal Contractors' Associations, who have contractural relations with Local Unions affiliated with the Sheet Metal Workers' International Association.

"Union" means any Local Union that is affiliated with the Sheet Metal Workers' International Association.

"Agreement" means the written apprenticeship agreement between the apprentice, the employer, and the union, in which the terms and conditions of apprenticeship are set forth. Each agreement shall contain a clause which makes these standards a part of such agreement.

"Apprentice" means a person between the ages of 16 and 21 who has agreed to work and learn the trade of sheet metal, and who has been certified by the Local Joint Apprenticeship Committee. It shall be at the discretion of the Local Joint Apprenticeship Committee to have apprentices registered with the State or Federal Committee on Apprenticeship.

"Employer" means the firm by whom the apprentice is employed.

"Supervisor of Apprentices" means the employer's agent, or the Joint Apprenticeship Committee's designated person, to perform the duties stated in the Standards of Apprenticeship.

"Standards" means this entire document, including these definitions.

Standards of Apprenticeship

1. Definition of "sheet metal apprentice." A "sheet metal apprentice" shall mean a young man at least 16 years of age, who has agreed to work at and learn the sheet metal trade, in accordance with the following standards:

It is recommended that the apprentice be indentured; and it is further recommended that the apprentice be registered with the State, and/or the Federal Committee on Apprenticeship, United States Department of Labor.

2. Qualifications for Apprenticeship Applicants. Applicants for Sheet Metal Apprenticeship, not heretofore connected with the trade, must be between the ages of 16 and 21, and should, if possible, be high school graduates or the equivalent. Exceptions may be made by the committee for those beyond the age limit who have been engaged in the trade or who have unusual qualifications.

3. Hiring of Apprentices. Employers desiring an apprentice shall make application for said apprentice to the Joint Apprenticeship Committee.

4. Obligation of Apprentice. The applicant, before assignment to employer, will copy the following obligation in his own handwriting, and file it with the Joint Sheet Metal Apprenticeship Committee:

"I, the undersigned, having made application to be enrolled as an apprentice with the Joint Sheet Metal Apprenticeship Committee, and having read the standards formulated by said committee providing for training of apprentices, and understanding same and all conditions therein contained, do hereby agree to serve such time and perform such manual training and study such subjects as the committee may deem necessary to become a sheet metal worker."

5. Term of Apprenticeship. The term of apprenticeship shall be not less than four years (approximately 8000 hours) of reasonably continuous employment. It shall be divided into eight (8) six-month periods of approximately 1000 hours each, not less than sixty (60) days being a probationary period.

During the probationary period the agreement may be cancelled by either party by notifying the other, but due notice shall be given the Joint Apprentice Committee. After completion of the probationary period, the agreement may be cancelled by the Joint Apprenticeship Committee for causes deemed adequate.

6. Work Experience. During the term of apprenticeship, the Sheet Metal apprentice shall be given such instruction and experience in all branches of his trade, including the preparation of materials, as is necessary to develop a practical and skilled mechanic. He shall also be given experience on all new machinery, materials and substitutes that may be installed in the shop or on the job during his term of apprenticeship.

7. Suggested Schedule of Processes to be Worked by Sheet Metal Apprentice.

(a) General Sheet Metal Work .....
(b) Operation of hand tools and power machines .....
(c) Ventilation and air conditioning .....
(d) Exhaust and blow pipe work .....

(e) Roofing, spouting, and guttering .....
(f) Cornice and skylights .....
(g) Gravity and forced air furnace work and servicing the same .....
(h) Warm air heating .....
(i) Special installation and specialty work, such as Kitchen Equipment work .....

In connection with the outline above, he shall be given such training over the period of his apprenticeship in soldering, welding, and brazing that is necessary for a sheet metal journeyman.

While the above outlines generally the type of work conducive to efficient training, allowance for variable conditions must of necessity be made.

8. Related School Instruction. (a) It is recommended that in addition to the training received on the job, the apprentice shall attend school one day each week with pay for said day during his apprenticeship, except during trade school vacation and sixty days of his probationary period. The time spent in school shall be a part of his apprenticeship, and this is to be attended in the first four years of his apprenticeship.

(b) In case of failure on the part of any apprentice to fulfill his obligations as to school attendance, the Joint Apprenticeship Committee, may suspend or revoke his agreement and the employer hereby agrees to carry out the instructions of the said Joint Committee in this respect.

(c) The Joint Apprenticeship Committee recommends that courses for Sheet Metal apprentices be limited to those who are actually apprenticed in the Sheet Metal Trade in accordance with these standards.

(d) The related classroom instruction shall be under the direction of the Sheet Metal Joint Apprenticeship Committee and shall act as an advisory and consultant body in determining subjects to be taught and any other problems pertaining to related education of the Sheet Metal apprentices.

9. Curriculum to be Taught in the School.

First Six Months:
Shop—Soldering, seaming, riveting, flanging, and welding.
Mathematics—Fractions, decimals, and percentage.
Drafting—Geometric construction, Isometric drawing, plain square and rectangular fittings.
Related Information—Kind of fluxes and use of each.

Second Six Months:
Shop—Laying out and fabricating square and rectangular fittings, and welding.
Mathematics—Mensuration and square root.
Drafting—Square and rectangular fittings.
Related Information—Use and care of tools and equipment.

Third Six Months:
Shop—Layout square and rectangular fittings and welding.
Mathematics—Circumferences and areas.
Drafting—Square and rectangular transition fittings.
Related Information—Source, use, and characteristics of sheet metal.

Fourth Six Months:
Shop—Layout square and rectangular transition fittings and welding.
Mathematics—Volumes and capacities.
Drafting—Parallel line development.
Related Information—Kinds and uses of rivets and other fastening devices.

Fifth Six Months:
Shop—Layout round tees, fittings and welding.
Mathematics—Velocities and air changes.
Drafting—Radial line development.
Related Science—Gutters and cornices.

Sixth Six Months:
Shop—Laying out round tapering tees, fittings, and welding.
Mathematics—Velocities and air changes.
Drafting—Triangulation pattern development.
Related Science—Metal roofing and skylights.

Seventh Six Months:
Shop—Laying out rectangular, square-to-round fittings, branches and welding.
Blueprint reading and duct designing.
Applied Science—Code of regulations.

Eighth Six Months:
Erection, setting fans, furnaces and welding.
Estimating.
Drafting—Measuring and detailing.
Applied Science—Blowers and furnaces.

10. Apprentice Work Card. The apprentice shall carry a working card signed by the Chairman of the Joint Apprenticeship Committee and secretary of the Local Union and this card shall designate the employer to whom the apprentice is assigned and the year of service. The apprentice shall pay for this card to the Local Union the initiation fee and dues as provided in the by-laws and rules of the said Union.

11. Periodic Examinations. Before the expiration of each six-month period, the apprentice shall be called before the Joint Apprenticeship Committee for examination, the apprentice to have a statement from his employer as to his progress on the job and a statement from his instructor as to his attendance and progress in related subjects. The committee shall examine the apprentice and determine whether the work specified for that period has been completed in a satisfactory manner. If the committee is satisfied with the progress of the apprentice, the committee shall issue to the apprentice and to the foreman a certificate to that effect, and then, and not until then, shall the apprentice be advanced to the next period. The foreman shall have the right to appear at any and all examinations.

It shall be the duty of the shop steward where registered apprentices are employed to make quarterly reports to the joint committee. These reports must show if the agreed conditions are being fulfilled by all parties to this contract—whether apprentices are being held back or if they are advanced in different processes of the trade, and where apprentices are negligent or incapable of becoming competent workmen it must be set forth in the report. The joint committee will analyze, investigate, and evaluate such information, then take whatever action is necessary to see that the apprentice receives the proper training. If such information reveals that the apprentice is negligent or incapable of becoming a competent workman, it shall be the duty of the joint committee to recommend revocation of apprenticeship by the local union. Whenever and if the Employer is at fault, action will be taken by the Apprenticeship Committee.

12. Supervisor of Apprentices. The employer shall designate a particular person in the shop (this may be a foreman, journeyman, or shop steward) to be known as the "Supervisor of Apprentices."

He shall, with the advice and assistance of the joint committee, be responsible for the apprentices' work experience on the job and the recording of same on the record form adopted for this purpose. It shall be his duty to see that this record form is complete in all details and forwarded to the Joint Apprenticeship Committee at the proper time for their information and record.

13. Apprentice Record Card. A master record of the apprentices' work experience and related instruction shall be kept by the Joint Apprenticeship Committee, this information to be furnished by the employer and the local school authorities. The record cards and all data pertaining to the apprenticeship shall be the property of the Joint Apprenticeship Committee and shall be accessible to the members of the organization at all times.

14. Agreement for Apprentices' Hours. The hours of work for the apprentice shall be the same as those of a journeyman.

15. Apprenticeship Agreement. Wherever and if the Local Joint Apprentice Committee require the Apprentice to be indentured the following agreement will apply. The apprentice and his parent or guardian (when he is a minor) shall sign an agreement which shall also be signed by the employer, approved by the Joint Sheet Metal Apprenticeship Committee. Every apprenticeship agreement entered into under these standards shall contain the provision shown in the sample agreement in Part A of the Appendix and a special clause making terms and the conditions of the standards a part of the Apprenticeship Agreement. For this reason every apprentice, parent or guardian, and employer entering into an agreement shall be given an oppotunity to read the standards.

The following shall receive copies of the apprenticeship agreement:

(a) The apprentice;
(b) the employer;
(c) the union;
(d) the Joint Sheet Metal Apprenticeship Committee;

16. Ratio of Apprentices to Journeymen. The ratio of apprentices to journeymen shall be one for each four journeymen regularly employed throughout the year.

17. Composition of Joint Apprenticeship Committee. The Joint Apprenticeship Committee is composed of three members from the Contractors Associations and three members from the Union.

18. Administrative Procedure. (a) The Joint Apprenticeship Committee shall elect a chairman and secretary and shall determine the time and place of regular meeting.

(b) The chairman and secretary shall have the power to vote on all questions.

(c) When, in any year, the chairman of the Joint Apprenticeship Committee is a representative of the contractors, then the secretary shall be a representative of the union, or vice versa.

(d) The Joint Apprenticeship Committee shall establish such additional rules and regulations governing its administrative procedue as are required.

19. Duties of the Joint Apprenticeship Committee.

(a) To determine the need for apprentices in the locality and the shop facilities available for the necessary experience on the job.

(b) To determine the adequacy of an employer to give proper training.

(c) To see that apprentices are under written apprenticeship agreements.

(d) To establish minimum standards of education and experience required of apprentices.

(e) To approve apprenticeship agreements between the employer and the apprentice.

(f) To determine the quality and quantity of experience on the job which the apprentice must have and to be reasonably responsible for his obtaining it.

(g) To hear and adjust all complaints of violation of apprenticeship agreements.

(h) To arrange tests for determining the apprentices' progress in manipulative skill and technical knowledge.

(i) To maintain a record of each apprentice, showing his education, experience, and progress in learning the trade.

(j) To make an annual report covering the work of the Joint Apprenticeship Committee to the contractors and the union. Minutes shall be kept of each meeting of the Joint Apprenticeship Committee.

(k) To be responsible in general for the successful operation of these standards by performing the duties here listed, by cooperating with public and private agencies which can be of assistance, by obtaining publicity, in order to develop the support of the public in apprenticeship, and by keeping in constant touch with all parties concerned—apprentices, employers, and journeymen.

20. Continuity of Employment. When an employer is assigned an apprentice, he may take him on a probationary period for not less than sixty (60) days. If, during these sixty (60) days of probationary period, the employer finds the boy is not suitable or unable to learn the trade, he shall notify the Joint Sheet Metal Apprenticeship Committee in writing to this effect and the indenture will be nullified. But, after a satisfactory completion of the probationary period, he shall undertake to keep him at work at the trade for not less than ten (10) months in each year, except in case of strike, lockouts, sickness, or other unavoidable causes, or by action of the Joint Sheet Metal Apprenticeship Committee. Where it is impossible for one employer to provide the diversity of experience necessary to give the apprentice all-around instruction in the trade, the Joint Apprenticeship Committee may transfer the apprentice, temporarily or permanently, to another employer, in which case the employer to whom the apprentice is assigned will assume all the obligation of the original employer, but in no case shall an apprentice be transferred to a shop where there is a labor dispute. Any officially registered apprentice who has been laid off will be given preference of assignment of apprentices thereafter.

21. Official Approval. Before becoming operative, the standards must have the official approval of the contractors and the union.

22. Adjusting Differences. In case of dissatisfaction between the employer and the apprentice, either party has the right and privilege of appeal to the Joint Apprenticeship Committee for such action and adjustment of such matters as come within these standards.

23. Amendments to these Standards. These standards may be amended at any time by a two-thirds vote by action of the Joint Apprenticeship Committee, subject to approval by the Contractors Associations, the Local Union and the International Association. Such amendments shall not alter apprenticeship agreements in effect at the time of such change without the express consent of all parties to such agreement.

24. Duties of Consultants. Consultants to the Joint Sheet Metal Apprenticeship Committee should attend meetings upon request of the committee on all problems affecting the agencies they represent, and render such assistance as will aid in improving the trade preparation of the sheet metal apprentices.

25. Relationship of Standards to Bargaining Agreement. Nothing in these standards shall be interpreted as being contrary to the present or subsequent bargaining agreement.

(Continued on Page 248)

The Sheet Metal Contractors National Ass'n

Reports—

By Patrick S. Varden, President

ON THIS, the ending of another year, we report a summary of the activities, progress, and accomplishments of our National Association, and observations of conditions facing and affecting our industry.

Our National Association will complete its fourth year of operation May 1, 1947. Almost three years of this period was during a devastating war. With all this, our membership has shown a sound and steady growth, and we now have many outstanding shops listed in our membership.

The need of strong national representation becomes more apparent as each year passes and as each problem is surveyed. As individuals we are helpless to do much.

Your National Association is the only means through which you can make your opinions and desires effective and is the only means through which we can bring about uniform conditions and coordinate the strength of our local and state associations to bring about fair and uniform conditions in our craft.

Problems Are National

Industry is faced today with many new proposals that cannot be settled in a haphazard manner, nor can they be ignored. They require sound and sensible thought and discussion, before decisions are made and must be uniform, just and effective, taking into consideration sound economy and public welfare.

The construction industry, of which we are a vital part, has come under considerable criticism and many theories have been advanced advocating changes. Some of these if accepted may seriously affect you as a contractor. We as a craft must be in a position to protect our interest, and to support any sound, helpful proposals or to combat any changes detrimental to our interests.

We in industry who have complained about Government regulations and interference in our business, and clamored for free enterprise must accept the challenge, and assume the duties and responsibilities to control and regulate our own crafts.

Labor is well organized and has done more in the past year to protect our crafts, than have we as contractors. Labor has shown a sincere willingness to cooperate with us.

Support Is Needed

There are many reasons why you need and should support your National Association as well as sound and active local associations affiliated with it.

Prior to our convention in St. Louis last May, a committee representing our National Association and a committee representing the International Association of Sheet Metal Workers held a two day meeting to discuss the problems facing our industry and to seek a basis for better understanding. As a result of this meeting, a joint National Labor Relations Board was formed and agreements drawn up to govern its operations.

Twelve regional committees are being formed to work with the National Board. A few months ago this board met in Washington with Government Officials on our serious steel situation. Results were obtained. This board also met in Washington with representatives of the aluminum industry. Results of this meeting may soon obtain special aluminum sheets satisfactory and workable in our industry.

Again members of this board met in Chicago with representatives of the local ventilating contractors and cleared up a jurisdictional disagreement of ten years standing in favor our crafts. Chicago ventilating contractors, as a result, received a general award of all heating and ventilating equipment with ducts to or therefrom. This is being carried to a national decision and a meeting of the presidents of the crafts involved and the national boards have been arranged to that end.

Apprentice Program

A Joint National Apprentice Training Committee is formed and is setting up national standards for the industry that will be filed with government Agencies within a few weeks. Training of mechanics is a very important function and should have the fullest cooperation from all our contractors.

Plans are in operation to increase the knowledge and training of some of our present mechanics.

Labor has shown its willingness to cooperate by inviting the chairman of our Labor Relations Committee and your president to address their international convention in Chicago and we were most courteously received by the officers and delegates and extended full information on the proceeding.

Bookkeeping—Trade Relations

A committee on bookkeeping is compiling a system in cooperation with accounting firms on estimating, bookkeeping, payroll and tax deductions. This will be presented at our next convention and will be available to all who need it.

A trade relations committee is in operation and with your cooperation can do much for our industry in regaining many of the items of equipment and supply directed into other channels through our neglect, and establish better relations with the suppliers of our material and equipment.

Other committees are in operation and are laying the ground work to accomplish our objectives.

Every sheet metal contractor must appreciate that these moves to protect and improve our crafts, to recover equipment and supplies lost or diverted into other channels, are badly needed and very worth while.

Association's Aims

To build up and improve our supply of highly trained me-

chanics; to cooperate and to work out sound, just and uniform agreements with labor; to cooperate to clear up jurisdictional disagreements on a national basis; to cooperate with our National Labor Relations Board to avoid disagreements and disruptions; to place ourselves in a position to protect public interest and the welfare of our employers and employees; to cooperate, control and regulate the operations of our crafts and be in a position to advise and counsel state and government agencies, as to our operations and importance to the public welfare—these, in brief, are the aims of the National Association.

Unless we are willing to support and promote such plans to protect our industry and the public we have no grounds on which to complain about conditions or regulations imposed upon us. If we want free enterprise we must accept the responsibilities and obligations imposed. If we want a democratic form of government we must each of us do our part to preserve it.

Our convention this year will be at the Stevens Hotel, Chicago, April 28th, 29th and 30th. This will be a time to meet your fellow contractors, to express your ideas, to see for yourself the plans and operations of your National Association.

Industry Must Maintain Our Jurisdiction

By Louis L. Narowetz
Chairman, Labor Relations Committee, SMCNA

(Address delivered Dec. 7 before 27th General Convention, Sheet Metal Workers International Ass'n)

SPEAKING about labor relations, the job that was given to me by our National Association was to create boards with officers in various sections of our country, as in Seattle, Los Angeles, San Francisco, Denver, St. Louis, Kansas City, Dallas, Cleveland, Chicago, New York, Boston and Baltimore. We tried to get together men who represent industry and who employ labor and could work with labor to carry on that part of our labor relations program which is necessary to the National Association of Sheet Metal contractors and labor.

We have a far reaching program in mind, but in the last year it has been rather hard for me, as Chairman, to get everything organized. The committee has been watching the administration in its workings with labor, to see if we could get a theme, but it is my humble opinion, that if employers and labor get back to the old custom of sitting around a conference table, we can get along better, and we need no starry-eyed people or attorneys who are not familiar with our work or working people. We can get together and settle our wages, our hours and our working conditions. We know we can live in a world that has progressed, and we also know that there are many more problems now than there were 15 years ago, when the chief problem was one of wages, and hours.

Today, we have various other problems—vacations, medical care, etc. I believe we are able to solve these problems in our stride and treat them as they should be.

Importance of Jurisdiction

As to labor relations, I feel a little freer talking about this because I came up through the ranks as an apprentice and I am still a member of this organization. Jurisdiction is the one important thing we have today. We must be careful and maintain it. But, it seems that a lot of our people, labor people and contractors alike, don't understand this, don't realize that it is the life blood of our trade.

The evolution in the manufacture of the ventilating unit is one of the most pertinent items that is being contested. This has been a controversial issue all over the country, and it seems that a lot of our contractors don't think it is essential to have it as a part of their contracts. Yet it is essential, for if the sheet metal worker has the unit in his contract it is more than likely that the sheet metal contractor will employ sheet metal workers to install the work. If the unit goes to the general contractor or the steamfitter, you may be sure that someone else is going to erect it or you are going to have to fight to erect it.

I think our people represented here, the leaders of our labor throughout the country and those who meet with our various contractors and employers should impress upon them that it is their fight, too. They shouldn't just go along, taking the attitude that after the unit is installed by others they will do the so-called tin work. They should strive to be ventilating contractors doing the complete job. This would help both contractors and workers.

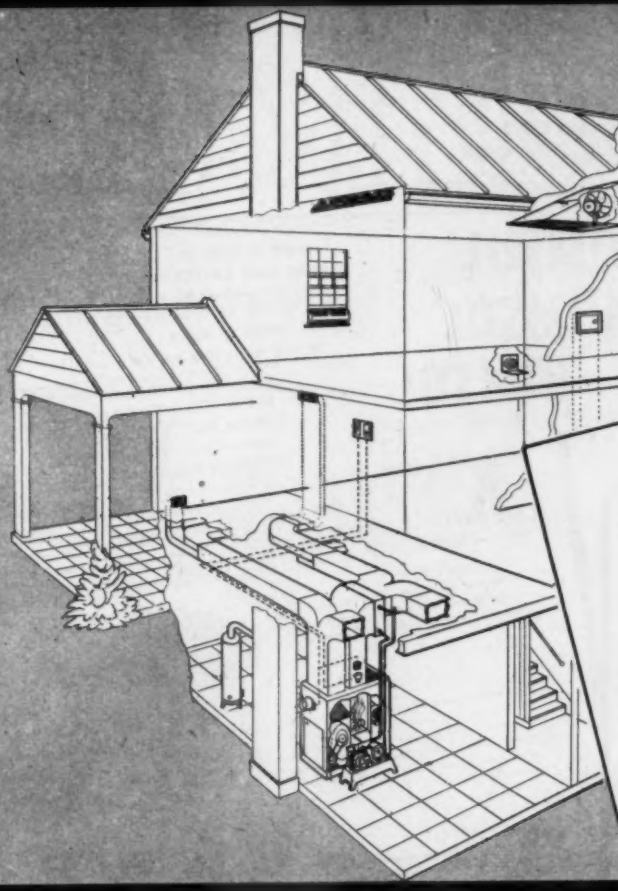
About 25 years ago you men all worked on jobs using conventional types of heating and ventilating. As we all know, this is composed of the fresh air intake, washer and filters with various dampers to mix the air and so forth. At that time, when the work was installed and before the advent of the unit ventilator, nobody questioned the right of the sheet metal worker to install his work. He put it together and when the time was ripe the fitter came along and set up his heater coils in our metal casing, but it was a sheet metal worker who made the layout, and set the positions of the various parts of the system, and no one questioned his right to do it. With the advent of the unit, however, built on a production line by the manufacturer, a controversy between the sheet metal worker and the steamfitter came upon us.

Area Jurisdiction Boards

As you know, throughout the country, there are four jurisdictional boards of award. There is one located, I understand, in the cities of Boston, New York, Washington and Chicago. It has been our pleasure in the last two or three weeks to have Mr. Wickman, your able "trouble shooter," come to Chicago where we had two cases being tried and "Bill," among others, presented his case so ably that the sheet metal workers were awarded the jurisdiction of the installation and the erection of units with ducts to and from.

This award should be carried on throughout the nation. It should go out into Texas and into Utah and into Virginia, as well. We in the industry should take heart; and we should not allow our units to be installed by steamfitters. We need not allow it. We should realize that these units are a part of our own jurisdiction; they are a part of our charter that was given to us as a trade. Where the labor leader in the area

(Continued on Page 240)



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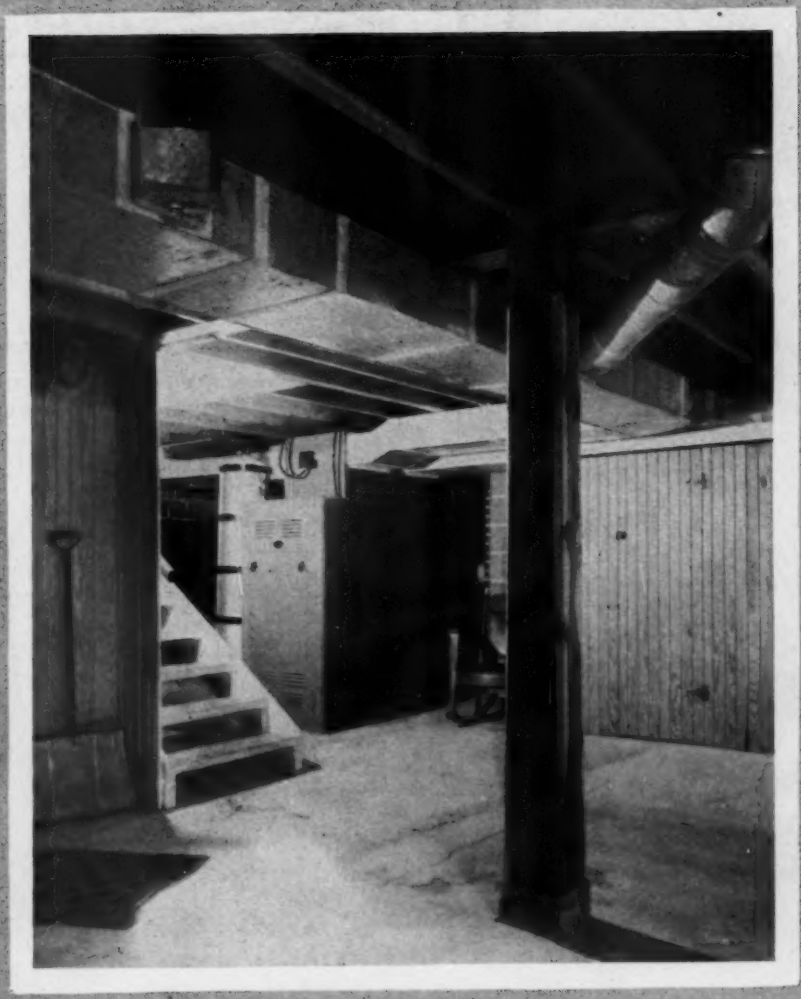

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ALUMINUM DUCTS

RANKING high among the interesting developments of 1946, has been the increased use of aluminum for ducts and pipes in warm air heating systems. Springing from the scarcities of normal heating materials, aluminum has established itself as a material readily fabricated, accepted by the buyer and, with one or two minor exceptions, well liked by the mechanics in the shop and in the field.

Strictly speaking, aluminum was not completely unknown to our industry prior to 1946. During the war, a number of large heating and ventilating systems were installed with aluminum and here and there over the country warm air heating contractors used aluminum when they could not get other materials. During the war, also, several furnace and fittings manufacturers experimented with aluminum for casings, plenums, and ducts.

Based upon the experience of 1946, the industry now has the answers to some of the faults found with aluminum during the war. Chief fault, without question, was the use of improper aluminum. Because, during the war, production was concentrated upon aluminum with characteristics suited to airplane construction, it followed that our industry tried to use—and often had to use—airplane aluminum. We found airplane aluminum too stiff; too hard; too brittle to put through our machinery.

At the end of the war, our industry, and others, believed there was in surplus aluminum an answer to material shortages. We learned the hard way that surplus airplane aluminum offers us nothing.

Suitable Aluminum

Briefly stated, the experience of 1946 indicates that the type of aluminum our industry finds acceptable is the 2S—¼ or ½ or ¾ Hard. Technically, this is "pure aluminum" without any copper, silicon, manganese or chromium and the ¼, ½, ¾ hardness gives just enough stiffness to permit assembly and rigidity on the job. Several users have found 3S—which contains 1.25% manganese—quite satisfactory. Aluminum of 2S—½H has these characteristics in pounds per square inch—14,000 yield; 17,000 ultimate; 11,000 shear; 7,000 fatigue; Rockwell hardness, E-22. The ¼ Hard and ¾ Hard are, respectively, about 1,000 to 2,000 lbs below and above the ½ Hard.

While the use of aluminum has been quite widespread around the country, there is concentrated in Minneapolis a greater than normal usage. To show how aluminum is handled; to describe the methods used to fabricate and erect; to point up the problems encountered—three large Minneapolis users were visited and, on following pages, the experiences of two users are described; the experience of the third user will be reported shortly.

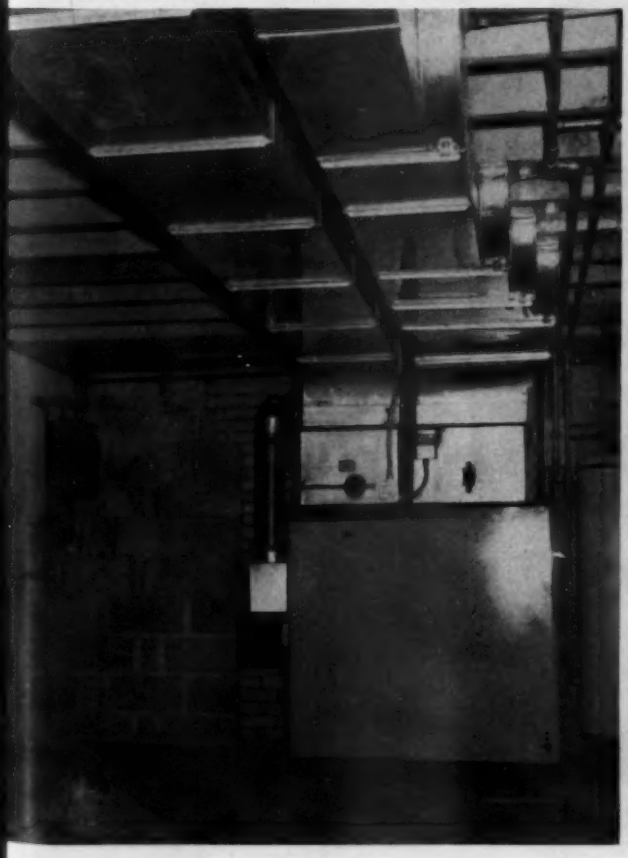
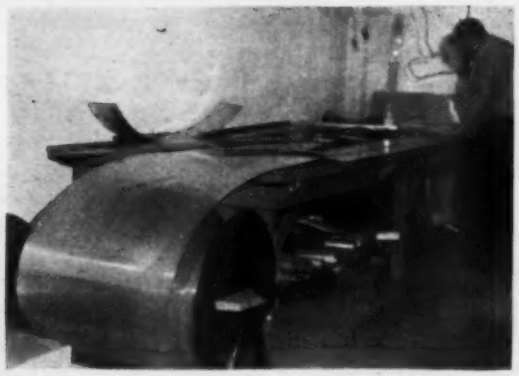


Photo at left shows a Cronstrom plenum and trunk of aluminum with stack size branches. Photo at right shows a Waterbury plenum and trunks of aluminum. Note in both cases the reflective sheen of aluminum.

Left — Cronstrom's very modern office and shop includes a display floor on which complete and operating heating systems can be shown to builders and owners. An important part of the display is the aluminum duct system designed to show sections, fittings, plenums just as they are built into the job. The display also includes all types of furnaces for all fuels.

Below — The layout benches—also shears—are provided with shop made reels from which the aluminum is pulled out on the tables for layout or shearing. Reel ends are adjustable for width of coil. Material is manually pulled from the coil.



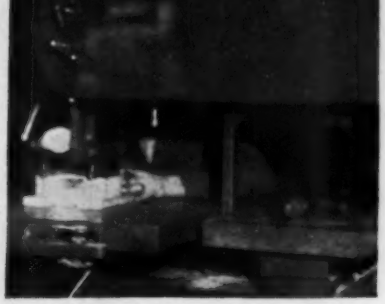
Above — No change is made in the power shear blade setting to cut aluminum. Blanks to be squared are delivered on a rolling table.

Below—The mechanic below is using a hand nibbler to cut irregular piece for a large fitting.

Above—Cut and squared sheets from the coil are put through the lockformer for double seaming. No change in setting.

Coils—to be put on the reel—are delivered by the chain hoist on shop made frame shown above.

Below—For fittings, piece blanks are stacked and clamped and cut in contour saw.



Right—Many of Cronstrom's aluminum production items are spot welded. To handle this work, automatic timer and pressure welders are used.

How Cronstrom's Heating & Sheet Metal Handles Aluminum

DURING the war, Cronstroms Heating and Sheet Metal fabricated of aluminum scores of "parts and pieces" for aircraft. From this experience it was a natural step to using aluminum for warm air heating systems. During the war and since, Cronstroms has probably fabricated a wider variety of items of aluminum than any shop in Minneapolis. Among these are: food boxes; children's toboggans; ventilating system louvres; hearing aid chassis; signs; sign letters; farm machinery cyclones; blower cabinets; heater casings; flue pipe, condensation Tees; chimney liners; condensation traps; draft diverters; and round and rectangular warm air pipe.

Material Preferences

For heating system round pipe, rectangular duct, fittings, Cronstrom finds these thicknesses best—.0329 (21 ga); .0299 (22 ga); .0239 (24 ga). Most of the material is ½ Hard, but ¼ and ¾ Hard have been used successfully. For flue pipe and chimney liners 3S—½ Hard.

Material Handling

Cronstrom buys his aluminum in coils. At the moment the aluminum as bought averages about 24 cents per pound—aluminum weighs only one-third as much as galvanized so the cost per square foot is about 8 cents—24 gauge galvanized is 4, 5 and 6 cents. He specifies his widths, but for rectangular ducts tries to use 30-inch width if possible. He also specifies aluminum from a 20-inch arbor. The size of the arbor determines the diameter of the hole in the coil. The larger the arbor the less the wave in the material as it is unrolled. A 10-inch arbor would make more waves; so Cronstrom specifies 20-inch.

A 30-inch width in 22 gauge is a coil about 2,000 feet long and weighs 2,340 pounds. The coils as received are stock-piled by size and gauge. A shop made chain hoist and hoist frame on casters picks up a coil from the stock-pile and conveys it to special reels which can be shifted to layout bench or shear as shown in the photographs facing.

Machine Work

Ordinarily, a coil is delivered to the squaring shear on which gages are set for certain common pieces. Cronstrom's practice is to shear and form pieces for sections and fittings in "runs of material." Thus, he may set up his machines to produce tops, bottoms and sides for straight duct sections. The pieces are squared and sheared for length to the extent of several hundred pieces.

Cronstrom finds no change is needed in the blade gap or setting of the shear over black or galvanized sheets of the same gauge.

Sections which are to have Pittsburgh locks from a lockformer are run through the machine using the same settings as for galvanized or black of the same gauge. Interestingly enough, the record shows lockformer rolls last much longer with aluminum than with black or galvanized and there is little trouble with wrinkling and tearing, but the material has to be kept moving because it has some tendency to "stick" in the lockformer rolls.

Round pipe is seamed on the ordinary grooved, single seamer machine. Customary machines crimp and bead round pipe. Almost no difference in setting is used in these machines over black or galvanized.

Since sections and fittings are made in lots of several hundred at a time, the contour saw is used to cut such parts as elbow cheeks, stack head cheeks, etc. As one photo shows, a stack of blanks as thick as 2 inches can readily be sawed—the number of blanks in the stack depends on the gauge. Cronstrom's practice is to scribe the outline on the top piece and cut to the scribing free hand. Whatever small deviation may occur is not considered serious. On pieces too large to run through the saw, hand nibbling is used.

Most of the duct work and fittings are seamed. Many other items—such as the farm machine cyclones, hearing aid chassis, etc., are spot welded. Cronstrom finds standard practice for spot welding aluminum—time, pressure, etc., works out satisfactorily.

Some items such as signs and sign letters of aluminum call for spot welding or gas welding—following recommended practice. Soldering of aluminum is now common practice using new types of aluminum solder.

Erection

In the erection of aluminum heating ducts, Cronstrom follows standard practice—mains are designed to equal friction, reducing in width as branches are taken off; branch takeoffs are from the side and upward in a Pittsburgh-locked elbow as shown in the photo of an installation on page 123; branches are wall stack size if possible. Because aluminum has less stiffness than galvanized, sections of main are kept to about 4 feet of length; sections are put together with aluminum standing seam cleats across the top and bottom with drive cleats on the sides. Mechanics report aluminum drive cleats have some tendency to "stick"; this might be alleviated by making a looser lock, but the "stickiness" is not of such magnitude as to require special attention. Sometimes oil is used on the drive cleats.

Plenums of aluminum are designed to customary practice with a canvas connection between plenum and casing and either a long sweep elbow where there is only one main or with direct takeoffs where there are several mains or individual branches or combinations.

Cronstrom has several hundred aluminum duct installations in use. He has found no need to provide special expansion joints in mains or branches in the size of house currently being built. He acknowledges that such joints might be used in very long runs to avoid any expansion noise.

Mechanics in the field (like the mechanics in the shop) like the light weight of aluminum. One man can handle with ease the largest section used in residential work. Like the men in the shop, there is less feeling of having lifted tons of material at the end of the day with aluminum; also aluminum is easy on hands and skin.

Return Air in Foil

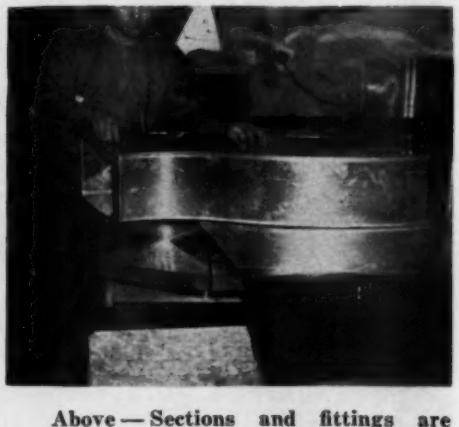
One interesting Cronstrom practice is to use aluminum foil (about .008 or 31 gauge) for panning return air runs. According to the Minneapolis code, return runs must be lined at the top (on the bottom of the floor above) with either paper

(Cronstrom text continued on page 246)

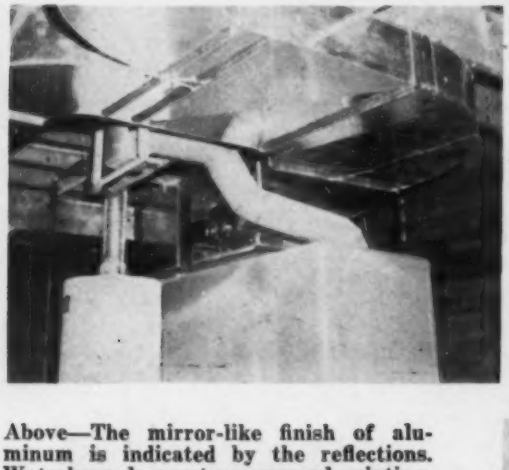
Typical aluminum construction for plenum and ducts (note canvas connection for noise elimination) on a large twin-furnace installation. Above, center—The difference in appearance of galvanized and aluminum is shown here—the center elbow is galvanized.

Above—Aluminum duct construction is identical with galvanized. At left—Aluminum of 2-S, .032 gauge ½ Hard goes through the lockformer without wrinkles or splitting.

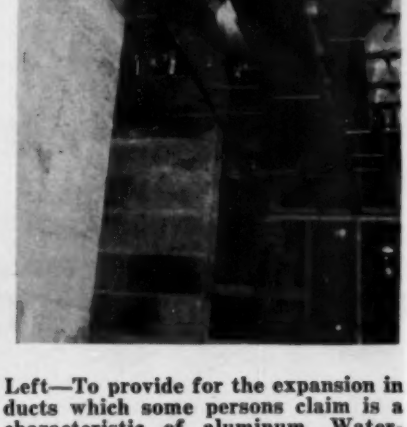
Above—Waterbury's shop-made reel. A hand turned forming roll, with two front rolls set for sheet gauge, pulls aluminum from the coil and flattens out waves. This is setup at shear. At right—Waterbury makes fittings from 28-gauge tin plate which have been previously aluminum painted and heat treated by a lithographer. Used for stacks and stack fittings.



Above — Sections and fittings are seamed and put together identically with galvanized. This section seam being closed is .032 gauge, 2-S, ½ Hard. Below—Aluminum ducts in a large installation showing branch dampers.



Above—The mirror-like finish of aluminum is indicated by the reflections. Waterbury does not recommend painting. Note the condensation Tee for this gas-fired system is also aluminum.



Left—To provide for the expansion in ducts which some persons claim is a characteristic of aluminum, Waterbury inserts a short canvas joint on extra long runs. At temperatures found in warm air runs, Waterbury questions the need for such a joint.

How The Waterbury Company Handles Aluminum

THE WATERBURY COMPANY, Frederick W. Legler, president, local retail sales and installing organization for the Waterman-Waterbury Company—but operating as a separate identity—and doing an almost exclusive warm air heating business, found material shortages severely curtailing its operations. To keep installations going, the company many months ago began to use aluminum. Like many others, the first aluminum tried was surplus war material—aircraft aluminum of the 24S and 32S alloys. And like others, the company quickly found this material not suitable for heating work. It was too brittle, too stiff, it cracked when put through the lockformer—even in very thin gauges.

Material Preferences

For both round pipe and rectangular ducts, the company now uses 2S—½ Hard in .0299 (22 gauge) and .0329 (21 gauge). For this material the company pays approximately 23 cents per pound delivered in coils. The preference is for 30-inch width and the rolls come about 2,000 feet long and weigh about 2,300 pounds per roll.

Fabrication

Since this organization concentrates on warm air heating, the shop equipment consists of lockforming machines, power squaring shears, throatless shears, power rolls, two elbow machines and the usual foot squaring shears and bending brakes and customary small bench machines and hand tools.

Shop fabrication follows closely methods used with black and galvanized material. On the shears, no changes are needed to cut aluminum—the company does find, however, that blades stay sharp for considerably longer periods. In the bending brakes the mechanics report easier forming, hence less fatigue at the end of the day.

Practically all duct work is Pittsburgh locked. No changes are made in roller settings for aluminum, but the machines have noticeably less wear and tear. Aluminum of the 2S—½ Hard type goes through the lockformer without cracking or wrinkling, but mechanics say the piece should be kept going through the rolls with positive pressure to avoid aluminum's tendency to "stick"—probably because of the softer temper.

Round pipe is single seamed in a hand seamer. Rectangular duct straight sections are made as top and bottom and two sides or top and side and bottom and side—depending on the width. In either case, the pieces are assembled by hand on the bench and malleted like galvanized or black. The material possesses sufficient stiffness to permit this method of closing the Pittsburghs.

Handling Coils

The material is purchased with a 20-inch arbor (diameter of hole in center of coil) and in this shop the coils are raised to bench or shear level by a chain block hoist.

In most cases, layout work is done on the cut material so the first operation is to shear suitable sheets from the coil. To facilitate this shearing, Waterbury has built an ingenious arrangement consisting of a reel to hold the coil level with the run-out table to the shear. The reel consists of two pipe spiders with connecting pipes, the spiders placed upon a shaft which turns in pillow blocks mounted on an angle iron frame as shown in one photograph on the facing page.

In order to accomplish two things in one operation, a standard slip roll former is placed between the reel and the shear table as shown in the same photo. The first two rollers are adjusted to the gauge of the material; the third roller aids in flattening the material. The third roll is set tighter and tighter as the center of the coil is approached and the kinks become more pronounced. Turning the crank uncoils the reel and the pressure of the rollers tends to flatten out the waves which come from coiling the material. By this simple device a sheet flat enough to permit close shearing tolerances and flat enough for duct work is obtained.

Light Gauge Stacks

The Waterbury shop is currently using an interesting idea which saves aluminum. Stacks and stack fittings, so far as possible, are being made from 28 gauge tin plate (bottle cap metal) which the company gets through a fortunate connection. This very thin material meets the requirements of the Minneapolis code for stacks and fittings.

Before the black tin plate is used by Waterbury, the sheets are sent to a local lithographer who paints both sides with aluminum and heat treats the materials. This gives a finish which matches the aluminum duct work and protects the metal.

As shown in one photo, the fittings are double seamed by hand, an easy operation with such thin metal. Straight sections are put through the lockformer and closed by hand on the rail.

Erection

There is some difference of opinion among the Waterbury mechanics as to the installing qualities of aluminum. Some say aluminum does not go together—nor do drive cleats slip into place—with the ease of galvanized or black. Other mechanics say the difference—if any—is too small to be counted and even if so can be readily overcome by (1) opening the locks slightly, or (2) applying a little oil to one contacting surface.

Both groups are agreed that handling aluminum sections is a pleasure—the light weight is especially appreciated in larger work where three man crews can be replaced by two men and even one man can handle quite a section.

Installation Practices

Waterbury installs practically all duct work with standing seam cleats across the top and bottom with drive cleats at the sides. Plenums, according to size, are erected as one piece or with duct cleats. So far as supply permits, galvanized is used on gravity furnaces and aluminum on forced air jobs, but aluminum is also used on gravity—at a premium.

In order to be safe—but without real proof of the necessity—long ducts have short canvas sections inserted to permit expansion under heat. The construction is shown in one photo of an installation in a very large residence where runs of 40 feet and longer are used. A canvas connection is used between plenum and casing—but for vibration or noise elimination.

(Waterbury Continued on Page 244)

Preview of Some Interesting Heating Possibilities

HELD in abeyance during the war, but now coming into the market, are several new ideas in heating with accompanying equipment. Some of these systems are quite outside all customary ideas and practices—some are logical developments of old ideas which have been stimulated by war usage—some are revivals of schemes tried years ago but now put forth as "revolutionary."

It should also be pointed out that a goodly part of the success these ideas seem to possess is due to the size and heat loss of today's houses—some of these "super-furnaces" would have found the going tough in the big, uninsulated houses built a decade or more ago.

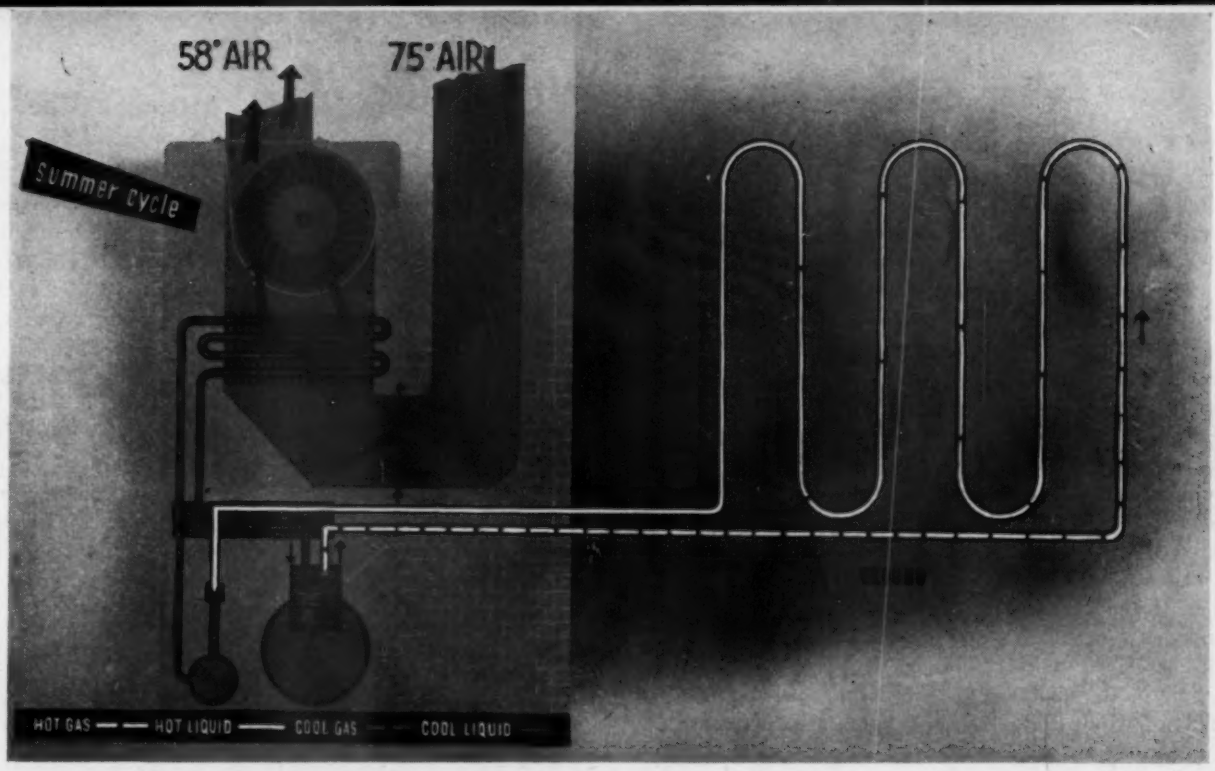
From the descriptive information received, five ideas have been selected for preview in this issue. These five ideas are—(1) the Heat Pump; (2) the Solar furnace; (3) the electric furnace; (4) the "Jet" furnace; (5) the bottled gas furnace.

The Heat Pump

MOST spectacular is the Heat Pump— sometimes called "reverse cycle refrigeration"—an idea not new, but definitely intriguing. As long ago as 1854 Lord Kelvin, the father of modern refrigeration, referred to the heat pump as "tomorrow's method of heating" but in all the years since that date the heat pump has remained the biggest "if" in heating. Today, its potential is greater than ever before because engineering advancements now make the idea practical for heating and cooling.

The heat pump is intriguing because no fuel—as such—is required. Conceivably, the heat pump can be used to power every household service except cooking—heating, cooling, hot or ice water, refrigeration. The heat pump operates in exactly the same manner as the household refrigerator, with essentially the same elements, and with exactly the same cycle. But instead of using only the "cold" produced by the refrigerator and throwing away the heat produced, the heat pump puts the heat produced to work warming the house. For each

In the heating cycle, the refrigerant passes through the buried coil where it picks up ground heat and is vaporized; then through a compressor which raises the temperature; then to the heating coil where air from the blower extracts the heat for the house changing the vapor to liquid; then the cycle starts over again.



In the cooling cycle, the flow is reversed so that vapor enters the ground coil, where the vapor changes to a cold liquid which enters the cooling coil. There air from the fan is cooled and in cooling it changes the liquid back to a vapor to complete the cycle.

unit of electrical energy required by the compressor it "borrows" two units of heat from a primary source—such as well or city water at 50°, or outside air down to 32° F. Adjustable valves determine whether the unit heats or cools.

The Terra-Temp company of Indianapolis, Ind., one of the organizations promoting the idea, expects to get into production in 1947. Although the exact retail price is still undetermined, the company estimates that the unit will sell for under $1,000. Some other heat pump manufacturers estimate that a unit whose cooling capacity is 32,000 BTU and heating capacity is 60,000 BTU will cost about $1,500. At present, Armour Research Foundation of Illinois Institute of Technology is conducting a sponsored research project on the heat pump for the Terra-Temp company. Results of this research work, as well as other data, will be revealed as soon as possible.

Inventor of the Terra-Temp heat pump is Robert C. Webber, of Indianapolis, who has had his model in operation in his home for the past two years. This heat pump utilizes a coil buried in the ground about 3 or 4 feet below the frost level through which Freon, a refrigerant, is circulated. The depth at which this coil will lie in any particular locality can be easily determined by ascertaining the frost level for that region.

How It Operates

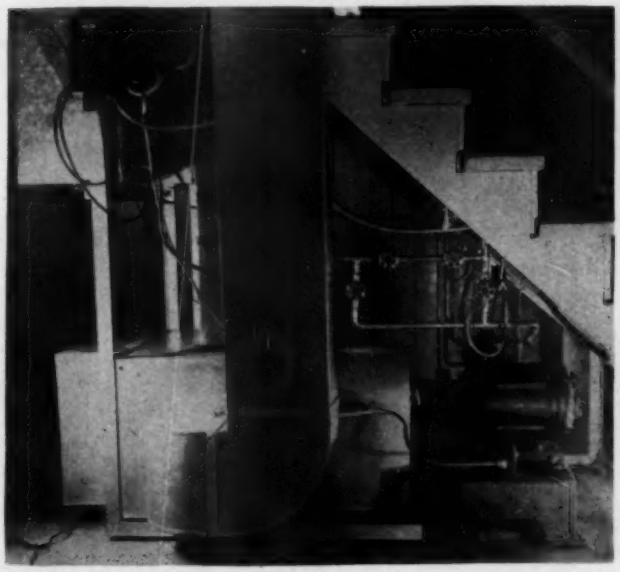
As the refrigerant, in a cold, expanded state, passes through the buried coil, it picks up heat from the comparatively warmer ground surrounding the coil and is vaporized. This vapor then enters a compressor where it is boosted to a higher pressure and a higher temperature. The hot vapor then passes through an air coil located in a ductwork and heat is extracted from this hot vapor by the air stream as it passes over the coil on its way to supply registers. This condenses the vapor in the coil into a liquid again which now flows to an expansion valve. In passing though the expansion valve, pressure and temperature are reduced and the fluid then flows back into the ground coil. Thus the cycle is completed. Automatic thermostatic control will reverse this cycle and interchange the function of the ground coil and the air coil, so that cool air will be provided to circulate throughout the house during the summer.

In the heating cycle the air leaving the coil is not raised to a temperature greater than 120 degrees F. and as a consequence, the system lends itself to continuous fan operation.

In size, the Terra-Temp unit resembles a large refrigerator, measuring approximately 40″ wide by 28″ deep by 60″ high. It can readily replace present heating plant installations.

Present operating costs of the Terra-Temp heat pump, according to the company, are equivalent to coal selling at $10

(Continued on Page 236)



Assembled apparatus in home of inventor Webber—compressor connected to motor, heating or cooling coil in housing in upper left corner; blower in housing at lower, left.

Solar Energy Utilization

THERE has been in process of development and research in Boulder, Colorado, as a joint effort of University of Colorado, Engineering Experiment Station and the Office of Production Research and Development of the WPB a study of the utilization of solar energy for house heating.

The principle studied makes use of a solar heat machine in which a group of partially blackened, overlapping glass plates, mounted like shingles, but separated by slight air spaces are mounted facing the sun. By virtue of the high transmissivity of glass for solar radiation and the low transmissivity for long wave thermal radiation, the black and clear glass surfaces in the unit become heated when exposed to sunlight and the reradiated heat therefrom has no avenue of escape. Air passing between the plates is heated and can be supplied to the house.

A first experimental unit was built in the laboratory and used tungsten lamps to produce artificial heat. This unit demonstrated that the idea and general construction was workable. Fig. 1 shows the principle. A second unit was then built on the laboratory roof. This unit operated through the fall and winter and established the principles of construction and operation.

Actual House Installation

A third unit was then constructed on a small house and connected by ducts to the regular warm air heating system. This collector covered about one-third of the entire roof area and occupied the usable surface on the *south* side of the roof. Electrical connections and automatic controls completed the installation and permitted its completely automatic operation. A system, designed to utilize the solar heated air to supply hot water for household use in the summer, was also installed and operated for a short period.

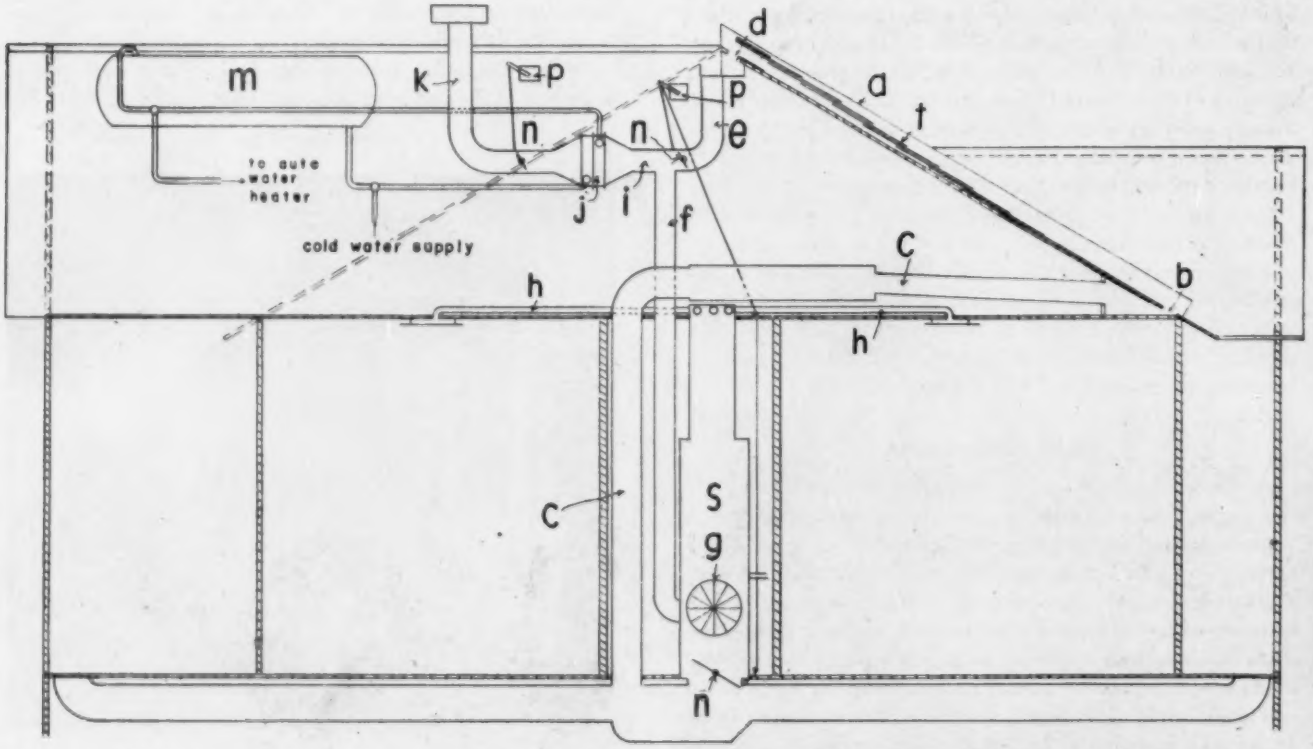
The results show that principles involved are workable, and that by them solar heat can be recovered with efficiencies of 35 per cent to 40 per cent, with exit air temperatures above 150° F. at noon on a bright day. Higher temperatures can be secured, but at lower efficiencies. Tilting of the collector to the south is desirable, and roof slopes ranging from the one equal to the latitude, up to approximately 10 degrees greater than the latitude, are near the optimum. Breakage of glass plates exposed to solar radiation, remains the greatest problem.

Locations north of the 40th parallel are generally unfavorable for economical solar house heating. Because of the possibility for using the solar heated air to operate an absorption type of air conditioner, it is felt that the greatest applicability of this system would be in the southern belt of the states. It is also believed that the net cost of the solar heating apparatus could be kept below $500 on large scale production.

Construction Details

The experimental house unit was constructed on the roof of the home of Dr. G. O. G. Lof in Boulder. Fig. 3 illustrates the construction of the unit.

Lying on the slope of the roof are sixteen supports constructed of 2″ by 6″ lumber supported and separated by iron strips which also act as supports for the cover glasses (a). In the sides of these pieces are cut appropriate slots into which are driven narrow strips of composition board; the slots and strips are positioned so that they will support the glass plates (t) in their proper relation. At the end of each strip is fastened a small wood block which prevents the glass plates from sliding down the roof. The assembly is built directly on top of the shingles of the roof but before the glass is laid, a ½ inch layer of board insulation is placed over the shingles. The supports



Arrangement of apparatus in Lof house—solar heater (a-t); regular furnace (s) with blower (g); supply ducts (h); return system (c); domestic hot water storage tank (m); and various motors (p) dampers (n); etc.—text facing describes operation.

are spaced on 32 inch centers and the glass plates are 29 inches wide by 36 inches long. The glass plates are placed in the optimum arrangement found in the tests on the outdoor unit which was found to be ¼" spacing, ⅔ overlap with 12 inches of each plate painted black. The cover glasses are put in place in grooves cut in the top side of the supports and sealed with putty; the ends of the cover glasses overlap in the manner of a green-house glazing. A cap strip of sheet metal is placed on the top edge of each 2 by 6 to protect the seal from weathering. A flashing made of sheet metal covers the top and bottom ends of the unit.

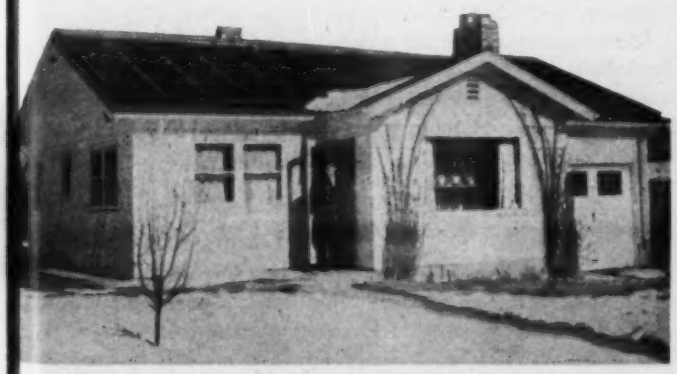
The entrance air inlet (b) is cut through the roof at the bottom end of the unit (this provides recirculation of house air) and a duct (c) is built from the house cold air return (r) to these openings in the roof. The heated air is drawn from the top of the unit through similar holes (d) cut in the roof. The duct system employed for the heated air is shown in the drawing and consists of a large duct (e) leading from the heated air outlets of the unit to the center of the attic where it divides into two branches. One branch (f) leads to the bottom of the furnace (s) and thence to the fan (g) and into the house warm air circulation system (h). The other branch (i) leads through a finned tube water heater (j) and thence to a natural circulation vent (k) through the roof, the top of which is higher than the top of the solar unit. The finned tube heater is used to heat water when the heat is not needed to heat the house. This heated water is stored in a 120 gallon tank (m) installed in the attic as shown in the drawing. This tank is connected directly to the inlet of the automatic hot water heater.

Installed in this duct system are suitable controls in the form of thermostats, dampers (n), damper motors (p), and relays which permit the unit to be operated in the following manner automatically:

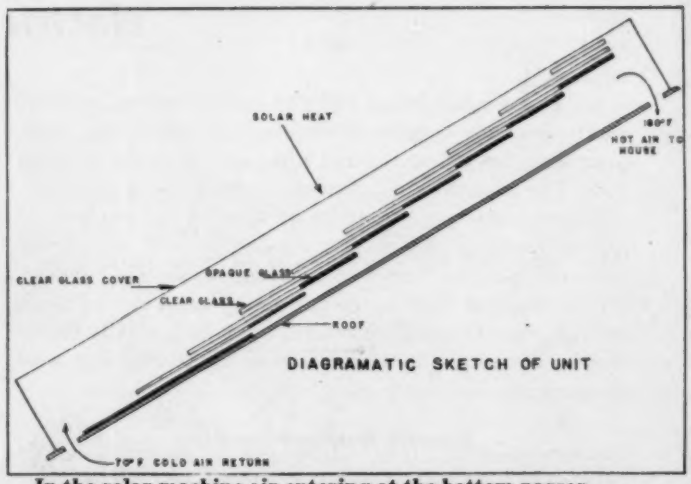
Case I. House is cold, solar unit is cold.
The automatic gas furnace heats the house in the normal manner.

Case II. House is cold, solar unit is hot.
The heated air from the unit goes directly to the furnace inlet and is blown by the furnace fan through the house heating duct system; the cold air return is routed back to the bottom of the solar unit.

Case III. House is hot, solar unit is cold.
Heating not necessary, therefore dampers are closed and furnace is not operating.



The solar heat machine occupies the entire southern slope of the house roof.



In the solar machine air entering at the bottom passes between the plates of glass—the black plates absorb sun heat while the clear glass keeps the air in contact with the hot black glass. As air heats its natural movement is upward—200 deg air is possible.

Case IV. House is hot, solar unit is hot.
The heated air from the unit is vented through the natural draft vent after passing through the finned tube water heater.

Before the unit was placed in operation the exit air temperature from each section was set at the same value by adjusting the air flow in the sections with dampers at the outlet (d) of each section.

Although experimental heat recovery efficiencies and exit air temperatures are not as high as predicted theoretically, the results indicate that solar energy can be used to heat air to temperatures in excess of 200° F. and that overall heat recovery efficiencies of at least 35% of total input can be secured. Of practical significance is the fact that a solar heating unit constructed and installed as described was provided with completely automatic controls; was tied in with the normal heating system; and was operated satisfactorily throughout one complete winter. A fuel saving of approximately 20% was realized.

Heat Storage

The most important problem not as yet investigated is that of heat storage. Heat storage calculations indicate that storage of heat only overnight in a bed of crushed solid, will more than double the heating load carryable by the solar unit, and will not require a storage unit too large for practical use.

The tests show that the 27° tilt, the addition of a storage unit capable of storing all the excess heat for one day, would increase the percent heating load carried from 34.0 to 54.8, but increasing the storage capacity the amount necessary to store heat for 2 or 3 days would increase the percent heating load only to 58.2 and 60.1 respectively. Therefore, the greatest advantage is obtained with a small storage unit capable of storing heat for one day, and the use of larger units may be impractical.

A well insulated chamber containing approximately 6 tons of crushed rock, coke, staggered cinder block, hollow tile, or similar material would provide heat storage capacity adequate for the requirement set forth above; the dimensions of such a chamber could be roughly 3 ft. x 3 ft. x 15 ft. When heat is not being supplied to the house, the recirculation of air from solar heat collector to the storage unit and back to the collector would permit higher storage temperatures and greater heat storage per unit weight of storage material.

Electric Heating

HAILED before the war as "the coming system," electric heating—because of obvious limitations—has made interesting, but not spectacular advances during the war and since. The most obvious limitation has been cost of operation.

Because electricity has always been under this handicap of higher operating cost, its acceptance has been pretty well restricted to areas where electric power costs are low—under 1 cent per kilowatt hour in the last step of the rate. Such areas are not general—the TVA area in the South and the Pacific Northwest remain, as before the war, the outstanding areas where electric heating exists.

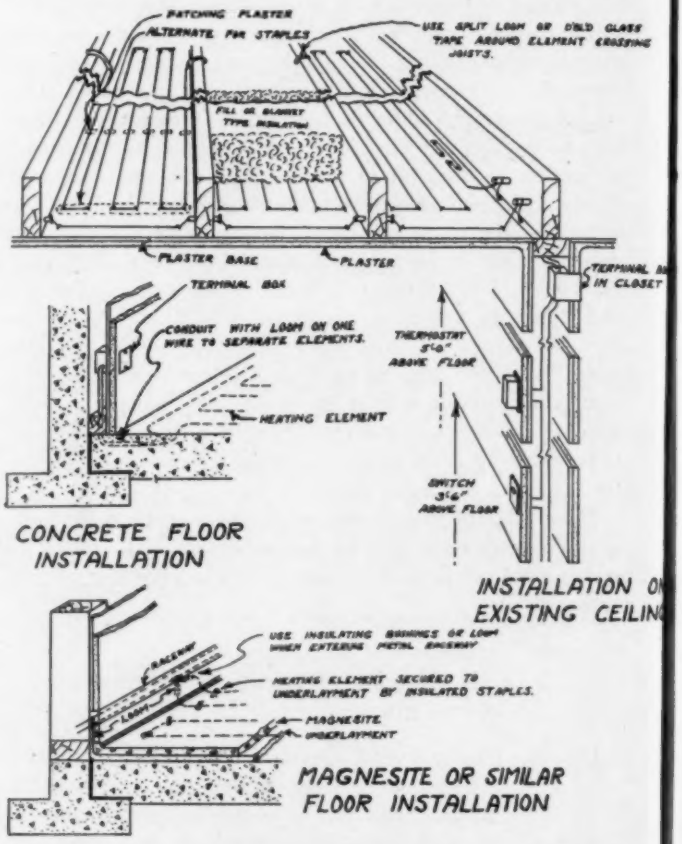
Electric Radiant Heating

Most interesting development is probably the use of electric heating cables in radiant panel heating. Out in the Puget Sound area there are now some 150 such systems in operation. In general, the heating cables are buried in the plaster of the ceiling or walls—or in concrete slab floors, the cables being looped back and forth to form a relatively close grid of wires. Cables are installed having 250, 500, 1500, 3000 watt capacities.

Using the rough figure of 3.4 Btu output for each watt input, the practice is to use a "U" factor of .005 and .007 for ceilings with 3½ inches of insulation and an exposed wall and floor factor of approximately .25. For concrete slabs on sand ground the factor used is .19—providing there is an insulation barrier between the edge of the slab and the foundation. No barrier —.30.

Based upon these design factors and at a design outside temperature of zero, the electric requirement is roughly calculated as 1½ watts per cubic foot for rooms over 2000 cu. ft. and 2 watts for rooms under 2000 cu. ft. Where the total requirement is close to the maximum of one element, the practice is to use two smaller—but equal—elements.

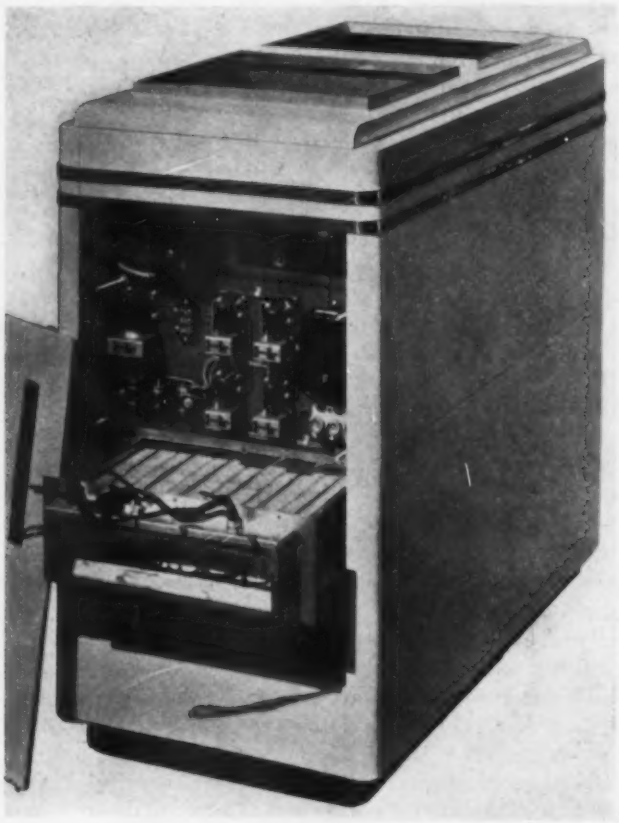
Some idea of cost for electric panel heating may be gained from the following (all houses in the Puget Sound area—about 4,800 degree days): (1) Six room brick veneer house; 16,700 cu. ft.; 30,500 KW consumption—$253.49 total cost; (2) Four room frame; 9,950 cu. ft.; 22,180 KW consumption


PATCHING PLASTER
ALTERNATE FOR STAPLES
USE SPLIT LOOM OR OILED GLASS TAPE AROUND ELEMENT CROSSING JOISTS.
FILL OR BLANKET TYPE INSULATION
PLASTER BASE
PLASTER
TERMINAL BOX
CONDUIT WITH LOOM ON ONE WIRE TO SEPARATE ELEMENTS.
HEATING ELEMENT
THERMOSTAT 5'-0" ABOVE FLOOR
SWITCH 5'-0" ABOVE FLOOR
CONCRETE FLOOR INSTALLATION
INSTALLATION ON EXISTING CEILING
USE INSULATING BUSHINGS OR LOOM WHEN ENTERING METAL ENCLOSURE
HEATING ELEMENT SECURED TO UNDERLAYMENT BY INSULATED STAPLES.
MAGNESITE UNDERLAYMENT
MAGNESITE OR SIMILAR FLOOR INSTALLATION

For electric radiant heating, the wire elements are embedded in the plaster or floor as shown. Each room has one or more elements sized for heat loss of that room.

—$228.24 total cost; (3) Eight room brick veneer house; 22,800 cu. ft.; 24,168 KW consumption—$226.46 total cost; (4) Five room frame house; 6,000 cu. ft.; 16,500 KW consumption—$157.19 total cost.

According to users, power companies and architects, electric panel heating offers these advantages: relative low cost at power rates under 1 cent per kilowatt; no heating plant or fuel storage required; individual room control by a switch or thermostat; low maintenance; no piping or duct work; extreme cleanliness.



Electric furnace showing heating elements pulled out of heating chamber.

Electric Furnaces

Also announced before the war were a few more or less conventional warm air furnaces using electric heating elements in place of coal, oil or gas. The development was stopped during the war, but now rumors are several such furnaces will be available shortly for areas with a favorable electric rate. Like the electric panel systems described above, electric

Electric heating wires are insulated from the material of the surface and are buried in the plaster.

furnace producers see only such areas as TVA and Pacific Northwest for the present.

One manufacturer (Electromode Corp.) has announced its furnace. Probably typical of others, this furnace comes in two sizes—up to 11,000 cu. ft. of house and from 11,000 to 24,000 cu. ft. of house.

A test installation in TVA territory (Lookout Mountain, near Chattanooga, Tenn.) has been under observation for one heating season. This house has 18,000 cu. ft. and a calculated heat loss of 111,000 Btu. It was formerly heated by a forced warm air furnace, stoker fired. The electric furnace is rated at 25 KW, 230 volts, 109 amperes, 60 cycles, a-c, single phase, with a rated output of 85,375 Btu's. Electrically, the house has an installed heating load of 1.4 watts per cu. ft. The 25 KW load is divided into six elements or zones, each rated 4,156 watts.

The electric furnace is forced air type with a 1,400 c.f.m. blower, air filters, humidifier in the plenum. Control is Moduflow, outside-inside thermostat operation—the reset control metering the flow of electric power to the six heating elements.

The electric utility reports that in the 1945-1946 heating season (3200 degree days) consumption was about 27,600 KW hours, representing a heating cost of about $200. Since the house is only partly insulated, full insulation might have reduced this cost by some 20 per cent.

These costs, which may readily be projected for colder areas and other power costs, seem to indicate that electric heating is quite high priced.

Electric furnaces of the type described here possess one point of merit—they can be installed in old houses using the existing distribution system; and in new houses with conventional distribution systems.

Gas Heating

DEVELOPMENT and progress in gas heating equipment can be said to be spectacular only in the unprecedented demand for gas as a fuel which has come from every part of the country. So tremendous has been this demand that at the moment a very large portion of the country is closed to new gas installations because the utilities cannot supply the load waiting to get on their lines.

Two developments, however, are likely to have far reaching effect. Both center on the use of liquid petroleum gas—First, the extension of LPG to areas outside the utility mains; second, the use of LPG supplied through sub-stations or portable units to augment normal gas supplies or to keep pressures up to normal.

It should be understood that this LPG program is only remotely related to the older "bottled gas" system. Whereas "bottled gas" was delivered almost as often as ice and was identified by rather small tanks which stood outside the house and were piped to stove, etc., the LPG program uses a buried tank holding enough L.P. gas to operate the heating plant and all the other gas equipment for at least 30 days. With the lower rates thus permitted by larger quantity purchase and fewer deliveries, the whole usage field for L.P. gas has widened spectacularly. House heating is, of course, of first interest to our industry; but it is reported that everything from incubators to crematoriums are now using LPG. In many areas with dense LPG service one large central tank serves whole groups of domestic users.

LPG service is growing rapidly; already there are areas where LPG service routes blanket the area like RFD. Gas companies are offering LPG service beyond their mains; fuel oil distributors are adding LPG routes; LPG specialists are offering the gas plus furnaces, stoves, water heaters and a long list of appliances requiring gas fuel.

Supplementary Gas

At the American Gas Association meeting this year, utilities reported that because of difficulties with materials and labor, few companies are in a position to extend their existing mains. Instead, many companies reported the construction of local area LPG holders equipped to mix Propane with air to bring the Btu content of the Propane down to the level of the local manufactured or mixed gas and to "bleed" this mixture into the mains to supplement the normal supply in times of maximum use. Other utilities plan to obtain "portable" Propane mixers which can be temporarily moved into areas of low gas pressure.

The problem of using LPG or mixing LPG with utility gas, focuses on the handling of LPG or Propane having a Btu content five to six times that of manufactured gas (something like 2700 Btu per cubic foot as compared with the usual 550 Btu for manufactured gas). In single domestic installations this problem is solved by the equipment and its air adjustment —with utility mixing for "bleeding" purposes the special substation equipment referred to solves the problem. Where LPG is installed to serve a group of users from one central storage, the high Btu content and pressure keeps the size and the cost of mains and service lines comparatively reasonable.

With the demand for gas for house heating continuing to rise and with the tremendous investment required to remodel, enlarge and extend utility gas service, it would seem that LPG shortly may become as commonplace as manufactured, mixed or natural gas for suburban areas, new communities, and the ever-spreading areas of rapidly growing cities.

Photo used in Life Magazine shows the McCracken "jet furnace" and gives an idea of the size of the unit. The small glass composition tubes convey heated air and may be woven into the framing as shown in the photo below. Somewhat similar practice is contemplated in the other offshoots of the aircraft heaters.

"Jet" Furnace (Aircraft Heater)

ABOUT one year ago—just before and after the ending of the war—rumors were widespread of pending revolution of house heating promulgated by the war-time producers of aircraft heaters. According to the rumors, a heating plant large enough for a six room house could be carried under one arm and could be placed behind last summer's old straw hat on a closet shelf. It wasn't quite clear whether these units would burn 100 octane gasoline—or how the units would get around fire and building laws—or what the producers would do about such everyday problems as extremely high velocity air, noise, products of combustion, etc. Not too much has been heard lately about these furnaces, but an occasional publicity release announces progress.

Hailed as revolutionary because of the small size, combustion efficiencies, elimination of customary distribution adjuncts, there is, in reality, not much revolutionary about these aircraft offspring. Old timers point out that more than 25 years ago, similar units to burn oil and gas—occupying only as much space as a four-drawer letter file and employing 3-inch downspout to deliver the air had quite a play.

Latest recruit to the ranks of the aircraft offspring is the "Jet" furnace—said by its inventor Calvin MacCracken to have combustion principles based upon aircraft jet engines—size for a nine room house about that of a small trunk; combustion chamber the size of a pint can; oil consumption at least 17 per

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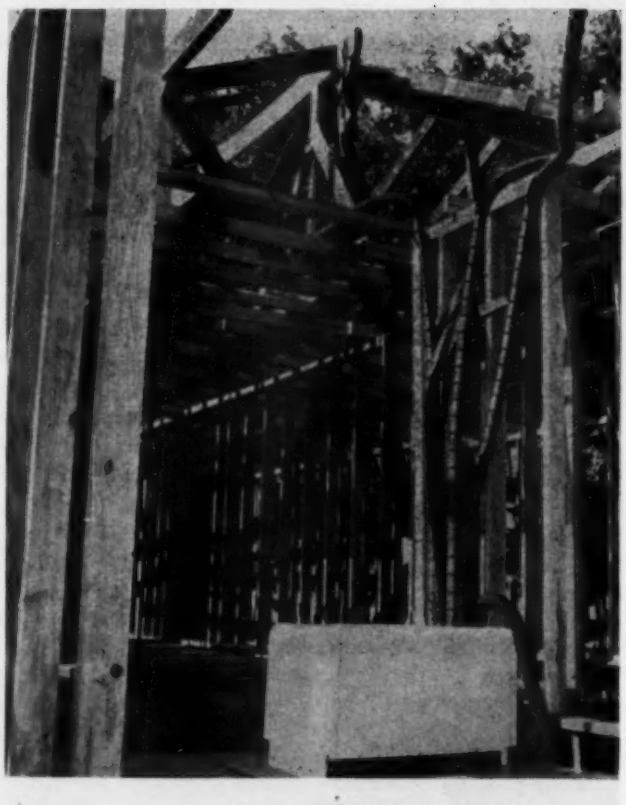

Gas Conversion Burner Standards are Needed To Protect Our Industry and the Public

If any one development in residential warm air heating should be singled out for special comment in reviewing 1946, undoubtedly the phenomenal demand for gas as a fuel warrants attention. In practically every study of the applications made to FHA and of the orders placed with heating contractors, gas-fired equipment showed unprecedented popularity.

Why this should be has been commented upon by numerous authorities—so far as the warm air heating industry is concerned it makes little difference "why"—our problem was and is to satisfy the demand.

Our situation would have been difficult enough if the problem had been restricted to finding equipment. But beginning early in 1946 gas utilities found themselves unable to supply gas equal to the demand and, in rapid order, announced that until production and distribution facilities can be increased no more residential gas installations can be accepted. As the situation stands today, there are large areas throughout the country where new gas installations are prohibited because of a lack of gas.

This situation needs little comment. When the utilities can furnish gas, residential gas heating seems destined for a boom.

Conversion Burners

The situation might not have become so acute, had the pre-war preference for complete gas-fired furnaces been allowed to follow its course. But because of shortages in supply of gas furnaces and components, potential gas users sought other means of burning gas, and, quite unexpectedly, began accepting gas conversion burners as a secondary, but insisted upon, piece of equipment. Almost overnight there sprang up in many cities producers of conversion burners. The long established manufacturers made earnest efforts to increase their production, but inability to meet orders placed opened the market wide for new manufacturers.

If these new producers had possessed some magic power which enabled them to find components which old established manufacturers could not find, the conversion burners which come into the market would not have introduced the problem of inadequate protection — they possessed no such power so almost immediately our industry and the utilities had another headache on our hands.

Cleveland's Program

Primarily, of course, both the warm air heating industry and the gas utilities share equally the burden of making proper and safe installations, but because the public looks to the utility for protection—and because utilities generally accept this responsibility—there came into being in 1946 a number of planned programs designed to educate the public and explain what is necessary.

Typical of such efforts by utilities is the advertising campaign sponsored by the East Ohio Gas Company of Cleveland. In a series of large advertisements in newspapers, the utility listed week after week seven vital requirements in gas heating equipment—but especially in conversion burners. These seven requirements are: (1) an automatic safety pilot; (2) an automatic gas valve; (3) a gas pressure regulator; (4) an approved draft hood on the flue pipe, (5) a room thermostat; (6) a limit control if the unit is in a boiler; (7) AGA Seal of Approval attached to the heating equipment.

The utility urged buyers to demand these features from the supplier of the equipment and to refuse to accept any equipment which lacked even one of these features.

Standards of N.Y.M.S.M.C.

After months of work, the New York Metropolitan Service Managers Council, announced late in 1946 their Standards for boilers, warm air furnaces and conversion burners used on *manufactured* gas. The expressed opinion of the Council is that if these Standards are complied with, much of the problem of safety and proper installation and operation will automatically be solved. In the Council's own testing laboratory, the Standards have proved adequate as a guide in determining the acceptability of all types of gas equipment.

The Council further reports that it is also essential that the conversion burner have proper combustion characteristics on the gas with which it will be required to operate. Some of the burners tested in the Council's laboratory were rejected because the burner would not ignite properly or would extinguish with a very loud noise on certain gases.

The Council also states that a decidedly important factor in obtaining satisfactory conversion burner performance is the installation itself. The highest quality burner, if improperly installed and adjusted, will give poor service. Rigid installation requirements by the utility is the surest way to obtain proper installation and adjustment.

Adherence to these Standards of the Council are by no means restricted to the New York City area—as the name might suggest. As of 1946 these Standards have been subscribed to by utilities representing over three fourths of the manufactured gas meters in the country—approximately 8 million meters. Subscribers to the Standards blanket the east coast with many large utilities throughout the middle west and south.

Summary of "Standards"

In the belief that these Standards are an important step to assurance of safety and proper operation, those sections of the Standards which apply to gas conversion burners are presented following:

N. Y. M. S. M. C. Standards for Manufactured Gas

These Standards are prepared for gas designed house heaters and conversion burners using atmospheric injection type burners and utilizing customary operating principles. In the case of special designs, incorporating marked departures from usual practices, it is intended that the Standards shall apply in all pertinent particulars.

1. A. G. A. Approval

Every heater must bear the A. G. A. Seal of Approval and must be listed in the current issue of the A. G. A. Directory. Such approval signifies compliance with a set of minimum standards. The Standards as given herein *are in addition to* the A. G. A. requirements.

2. Overall Acceptance:

Gas heating equipment shall be subject to the approval of the gas utility serving it, or the public authorities having jurisdiction.

3. Instructions:

(a) Adequate instructions and diagrams shall be provided for the assembly of the heating equipment including all controls and accessories. (Section 11-j.)

(b) Clearly defined and complete instructions for lighting and shutting down the appliance shall be provided for the user on a rust-proof metal plate on or adjacent to the controlling device, and securely fastened in a position where they can be easily read. (Section 7-c.)

(c) A complete appliance wiring diagram covering all high and low voltage circuits and connections shall be affixed to the outlet boxes. (Section 11-o.)

4. Integral Appliance Gas Tubing:

(a) Aluminum tubing is acceptable for conveying gas except when it is exposed to temperatures in excess of 500 degrees Fahrenheit, moisture or condensate.

(b) No copper or brass tubing shall be used, except where internally tinned and then only where the tubing is not exposed to temperatures in excess of 200 degrees Fahrenheit.

(c) All semi-rigid tubing connectors and fittings larger than one-quarter inch O. D. shall be of the flare type.

5. Manual Shut-Off Valves:

(a) A manually operated lever handle valve, labeled "Main Burner Shut-off," shall be provided to control the gas supply to the main burner manifold. This valve shall be located externally to the jacket, adjacent to the electrical ignition device, and ahead of all controls except the pilot control valve, and shall be marked so as to indicate the "On" and "Off" positions clearly.

(b) The pilot gas supply shall be provided through a tapping on the inlet side of the main manual shut-off valve. The pilot line shall be equipped with an individual control valve which shall be so located as to permit easy and quick operation and shall be marked or designed to indicate the "On" and "Off" positions clearly.

6. Main Automatic Control Valves:

(a) Solenoid or magnetic valves, serving as main automatic control valves, are not acceptable in present known designs.

(b) Provision shall be made to permit manual operation of the main automatic control valve in case of current failure. The mechanism to effect such operation shall be exposed, and operating instructions shall be clearly indicated on or adjacent to the main automatic control valve. Automatic recycling shall be instituted with the restoration of the current supply.

(c) All automatic main control valves in which flexible diaphragms constitute the only gas seal shall have the atmospheric side of the diaphragms enclosed in a gas tight casing furnished with a bleed connection.

(d) The safe closure of a main automatic control valve shall not be dependent on a restricted opening in which the smallest dimension is less than the diameter of a No. 50 drill, unless the gas supplied to this restriction is passed through an approved type of gum protective device and the restriction is protected against closure by falling scale.

(e) Valve discs of main automatic control valves shall be of good quality leather.

(f) Reverse acting gas actuated controls must be so arranged that the escapement gas bleeds off only momentarily and there is no continuous bleed during either "on" or "off" periods.

7. Pilots:

(a) A safe and convenient electrical pilot ignition device shall be provided for the user to start the appliance. Cycling automatic electrical ignition pilots are unacceptable in present known designs. The controlling device for a non-cycling ignitor shall be placed adjacent to but not in front of the appliance, and from 4 to 5 feet above the floor and shall be readily accessible to the user.

(b) Provision shall be made to interrupt automatically the current flow to the pilot ignitor when the valve controlled by the safety pilot is in the open position.

(c) Clearly defined and complete instructions for lighting and shutting down the appliance shall be provided on a rust-proof metal plate for the user on or adjacent to the controlling device, and securely fastened in a position where they can be easily read.

(d) Pilot and bleed assemblies shall be made secure against accidental displacement. They shall be so constructed and installed that without the use of special tools and with reasonable care they may be removed even when hot and without removing main burners, controls or accessories or breaking any gas connections other than that of the pilot supply or bleed line.

(f) Pilot ports shall be positively positioned with respect to the main burner ports.

(g) Approved gum protective devices shall be placed ahead of pilot gas adjustments to prevent gum and dirt obstructions. These shall be installed in such a manner as to permit them to be easily removed and replaced.

(h) Pilot tips, diaphragm valve bleed tips, and regulator vent tips shall be made of material having heat and corrosion resisting properties equal or superior to AISI Type No. 416 steel.

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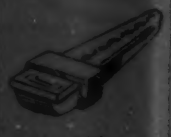
Cast Iron Furnaces

Forced Air Units

Oil-Fired Air Conditioners

Oil Burners

Add-On Blowers



Humidifiers

Automatic Controls

Tim Snips says:

PREMIER is working to help Independent Furnace Dealers make more Sales, more Installations and more Profits in 1947...

It looks like 1947 is going to be a mighty good year for the Independent Furnace Dealer — and we're going to do everything in our power to make it so.

During 1947 we expect to make substantial increases in production and shipments. That will please our dealers more than anything else. They need and want merchandise, and we're going to do everything we can to see that they get it.

For many months we have been working to solve material and manpower shortages. Many kinds of materials and supplies are still extremely scarce. Despite this, we have greatly increased our output of steel and cast iron furnaces — and in the months ahead we expect to get production on additional PREMIER heating and air conditioning equipment that has been practically off the market since 1941.

As production grows, you'll likewise see a corresponding increase in the PREMIER program of selling, advertising, engineering and financing cooperation for all our authorized dealers.

PREMIER FURNACE CO., Dowagiac, Michigan

(i) Each individual combustion chamber shall be equipped with an automatic pilot.

(j) Adjustment devices for setting automatic pilots shall be so designed that it will not be possible to make an adjustment that will cause the pilot to fail in an unsafe position.

(k) Prompt ignition of main burner ports shall be assured from that part of the pilot flame which operates the safety device, adjusted to the smallest flow required to hold the automatic pilot valve open.

(l) Electric make and break contacts shall not be placed within the combustion chamber unless completely protected against any deterioration by heat or products of combustion.

(m) Pilots shall be so designed that the ports and operating mechanism cannot be obstructed by falling scale and dirt.

(n) The time required for an automatic pilot to assume the postion required of it in service for turning on the gas supply after the pilot has been lighted shall not exceed three (3) minutes when the device is operated in accordance with the manufacturer's instructions.

(o) The time required for an automatic pilot to assume the postion required of it in service for closing off the gas supply shall not exceed one and one-half (1½) minutes.

(p) In case of failure of the thermal or actuating mechanisms, the automatic pilot shall cause the gas supply to the main burners to be automatically shut off.

8. Main Burners:

(a) Burners and mixer tubes excepting mixer tubes of conversion burners shall be removable through an access opening or door, without disconnecting, dismantling or removing the pilot assembly, controls, burner manifold or any parts other than the access door.

(b) Burners and mixer tubes shall be properly placed and firmly secured without the use of screws, bolts, cotter pins, etc., so that they will not twist, slide, or drop out of position. Restrictions as to method of fastening need not apply to mixer tubes and single port burners of conversion burners.

(d) Blue flame burner ports shall be of cast iron or of other material having equal or superior heat and corrosion resistant properties.

(e) Integrally cast burners, supplied by two or more gas orifices, shall be so designed that no burner port can receive gas from more than one orifice.

(f) The design of burners and the size of ports of drilled port main burners shall be such as to provide quiet burner operation. In general, port sizes in the range of No. 40 to No. 45 DMS are considered as giving compliance with this Standard.

(g) If the burner and mixing tube are in two sections, they must be connected by either a threaded or machined joint, without set screw. Threaded joints are unacceptable on conversion burners unless the burner head and mixer tube can be removed as a unit, in accordance with paragraph 8-a.

(h) Ribbon burners are acceptable, provided that ribbons can be readily removed and replaced in the field by the service man for the purpose of cleaning; and the design is such as to prevent settlement of scale on the ribbons.

(i) Burner ports shall be so arranged that carry-over from row to row must occur at 2 or more points.

9. Air Shutters (Including pilot shutters):

(a) Threaded and sliding disc shutters providing a circumferential opening are unacceptable.

(b) Where air shutters are used there shall be no opening other than the adjustable opening through which primary air may be entrained. Other openings, such as between air mixer and air shutter faces, or around the gas cock orifice projection, shall be reduced to a practical minimum so as to have no appreciable effect on the flame characteristics when stopped by lint or other means. Air shutters shall have one primary air opening near point of closure.

(c) Surfaces between air shutters and mixer faces shall be sufficiently smooth as to obtain a luminous flame when closed. Means shall be provided to fix air shutters securely in any position. Such means shall be unobstructedly accessible for adjustment with the burners in operation and shall be so located as not to interfere with adjustment of orifice caps when used.

(d) Fixed primary air openings on blue flame pilots are acceptable if they are of a size that will give a satisfactory flame when using a gas orifice delivering the rated input on the gas supplied in the area where the equipment is to be connected. Otherwise blue flame pilots shall be equipped with adjustable primary air devices with positive means for locking them in place.

10. Gas Orifices:

(c) On main burner orifices of the camera type, provision shall be made for the positive locking of the adjustment device which shall be of a design not susceptible to ready tampering. Orifice adjustment shall be possible without removing the orifice assembly.

(d) On main burner adjustable orifices of the needle type, the adjustment device shall be effectively concealed to prevent tampering.

(e) All pilot burners shall be provided with fixed orifices.

11. Control Equipment:

(a) All controls shall be accessible for servicing in position without removing any piping, fittings or controls. Removal of a panel or door to secure access to a control compartment shall not be considered a violation of this Standard. Where combination controls are used, provision shall be made to permit the physical removal of the control from the assembly without removing other piping, fittings or controls.

(c) No gas carrying member of any control on a warm air installation shall project within a warm air duct or chamber.

(d) Main burner controls, such as automatic main valves and gas pressure regulators, shall be adequately protected against undue overheating when installed in enclosed compartments. A temperature rise not to exceed 40 degrees Fahrenheit above room temperature is recommended.

(f) All warm air furnaces shall be provided with effective adjustable means for limiting the air temperature in the bonnet. In the case of fan or blower type warm air furnaces, this means shall be effective when the supply of electricity to the furnace is interrupted.

(h) Fan switches and temperature limit controls shall be so located as to control outgoing air temperatures accurately without being affected by radiant heat from the sections.

(k) Diaphragm assemblies of gas pressure regulators and diaphragm gas control valves shall not be made up with rivets, but shall be secured with bolts or equivalent, to permit easy replacement of the diaphragm.

(l) No gas control shall be located in a trapped position.

(m) Pressure regulators shall be of an adjustable single seated type and shall be equipped with valve seats and ports of brass or of equally corrosion resistant material.

(n) Connections from high and low voltage electrical devices (thermostat clock excepted) on the same appliance

shall be brought to two outlet boxes and connected to suitable terminal blocks located therein. An alternate arrangement of plug and receptacle connections for each electrical circuit may be used to connect each circuit to the terminal block. Means shall be provided to prevent the interchange of such plug and receptacle connections between high and low voltage circuits. All connections to such outlet boxes or terminal blocks shall be made in such a manner that any one of the electrical attachments may be removed without breaking a soldered wiring connection.

(o) A complete appliance wiring diagram covering all high and low voltage circuits and connections shall be affixed to the outlet boxes.

(p) All electrically operated main gas control valves shall be of a type that will close upon current failure.

(q) Electric conductors, when subject to exposure at high temperatures, shall have approved fire resistant insulation and shall in any case have Underwriters' Laboratories listing.

(r) Electrical leads and connections for lighting coils shall be thoroughly insulated against accidental grounding.

16. Bleeds:

(a) Bleed lines from diaphragm control valves and gas pressure regulators shall be furnished.

(b) Bleeds from diaphragm control valves and gas pressure regulators shall vent into the combustion chamber.

(c) Bleed lines venting into combustion chambers shall terminate in suitable burner tips (as defined in item 7-h), and shall be located parallel to and approximately ½ inch away from the pilot burner (below pilot burner for horizontal pilots), with the vent outlet terminating approximately 1 inch ahead of the pilot port with respect to direction of gas flow.

(d) Bleed line burner tips shall be securely fastened and made a part of the pilot assembly.

(e) A No. 40 mesh brass wire screen, sufficient in size to provide free area equal to the area of the vent tubing, shall be installed in and made a part of the connecting fitting for installation at the regulator vent tapping.

19. Miscellaneous:

(a) A machined joint union shall be attached at the nearest accessible position to the inlet side of the gas pressure regulator.

(b) Sheet metal screws shall not be used to fasten parts subject to a considerable load or vibration.

(c) A ⅛" I.P.S. plugged tapping, fully accessible for test gauge connection, must be furnished in the burner manifold.

(d) Combustion air controls, if used, shall be constructed so that they fail in the open position, and shall permit manual operation of the burners. The operation of the automatic gas valve shall be independent of the manipulation of the air door.

(e) A heater, under continuous normal operation, shall show no signs of undue overheating. This applies to burners and other component parts.

News Shorts on Heating Subjects

Set Aside Order Revoked

EFFECTIVE January 1, 1947, the so-called "set-aside" order which has required jobbers to hold 75 per cent of all furnaces received for orders bearing priority ratings, is revoked (Schedule B of PR 33).

After January 1, therefore, warm air furnaces, oil burners, controls, etc., which were subject to Schedules A and B need not be held for priority orders by either jobbers or by manufacturers selling direct to dealers.

One part of the order still remains in effect—dealers are still required to honor outstanding priorities as they are presented. Also, jobbers must honor priorities when presented by dealers, but jobbers and direct-to-dealer selling manufacturers need not hold 75 per cent of their equipment receipts for these orders.

◆

Electric Motor Standards

STANDARDS for fractional horsepower motors, designed to reduce production costs, insure efficiency and proper application are announced by the members of the National Electrical Manufacturers Ass'n, Motor and Generator Section. As an example of what the group hopes to do, they say that pre-war one company produced motors for oil burners in one frame diameter of 2,450 different models. By the new Standards these will be reduced to 17.

The new Standards provide specific definitions of motor rating and performance in coordinated terms of horsepower rating, speed, breakdown torque, and service factor.

As a result of better standard definitions, the appliance manufacturer can obtain proper motors from all suppliers without having to go through exhaustive engineering tests for each application or make of motor.

In the past the horsepower stamped on a fractional horsepower motor plate has not always been a true indication of the motor's load carrying ability since no adequate standard had previously been established to define horsepower rating in terms of speed and torque. These new standards should obviate these difficulties.

◆

New Housing Rules

AS of the year end, these are the latest rules issued for the new housing program: (1) Veterans still have preference on permits and builders must hold houses for veterans for 60 days after completion; rental property must be held for 30 days for veterans.

(2) A veteran who wishes to make alterations and repairs up to $10,000 worth is eligible for a permit. Non-veterans may ask for a permit if the cost exceeds the $400 small job but make repairs or alterations under $400 without a permit. (3) Permits will be granted anyone for repairs to structures destroyed by disaster.

(4) Space limitation has been increased. Builders doing work under a permit must see that the total floor area measured to the outside of the exterior walls, excluding basements and unfinished attics, open porches, terraces and garages does not exceed 1500 square feet. Only the number of fixtures normally used in equipping one bathroom may be installed.

(5) Priorities issued under the former program must be honored. This may mean that for many materials and products the outstanding priorities may absorb available materials. What good a new Federal permit will be in such a case is a matter for speculation. (6) There undoubtedly are many thousands of old priorities outstanding. The builder may elect to exchange such priority rights for a new permit and thereby be free of all old ceilings on size, cost, etc.

Design Data for a Warm Air Floor Panel with a Supplementary Forced Air System for Ventilation, Cleaning, Humidification and Mild Weather Heating

By Axel B. Algren

Associate Professor of Mechanical Engineering and Head, Division of Heating, Ventilating and Air Conditioning, University of Minnesota

MANY articles have appeared describing panel heating systems which have been installed in regions where outside design temperatures were moderate and conditions appeared to be very favorable for this method of heating. Very little information has been published, however, on installations where the outside design temperatures were -20 F or lower. For lack of specific information, the practicability of panel heating, and especially floor panel heating, has been questioned in those localities where sub-zero temperatures exist for varying periods during the heating season.

The purpose of this article is to describe the design of a floor panel heating system now being used in a residential building project where the outside design temperature is -20 F and, also, to discuss those factors that might be considered as an integral part of the design.

National Builders, Incorporated, of Minneapolis, Minn., are developing a seventy-acre tract of land called "Countryside Addition" which is located in Edina, a suburb of Minneapolis. A total of 105 houses have been planned, all of an advanced design. Each has been individually designed by Carey Caraway, a disciple of Frank Lloyd Wright, for each lot of approximately half an acre in size. A perspective and a floor plan (next page) of one of the units now under construction are shown in Figs. 1 and 2.

Design Principles

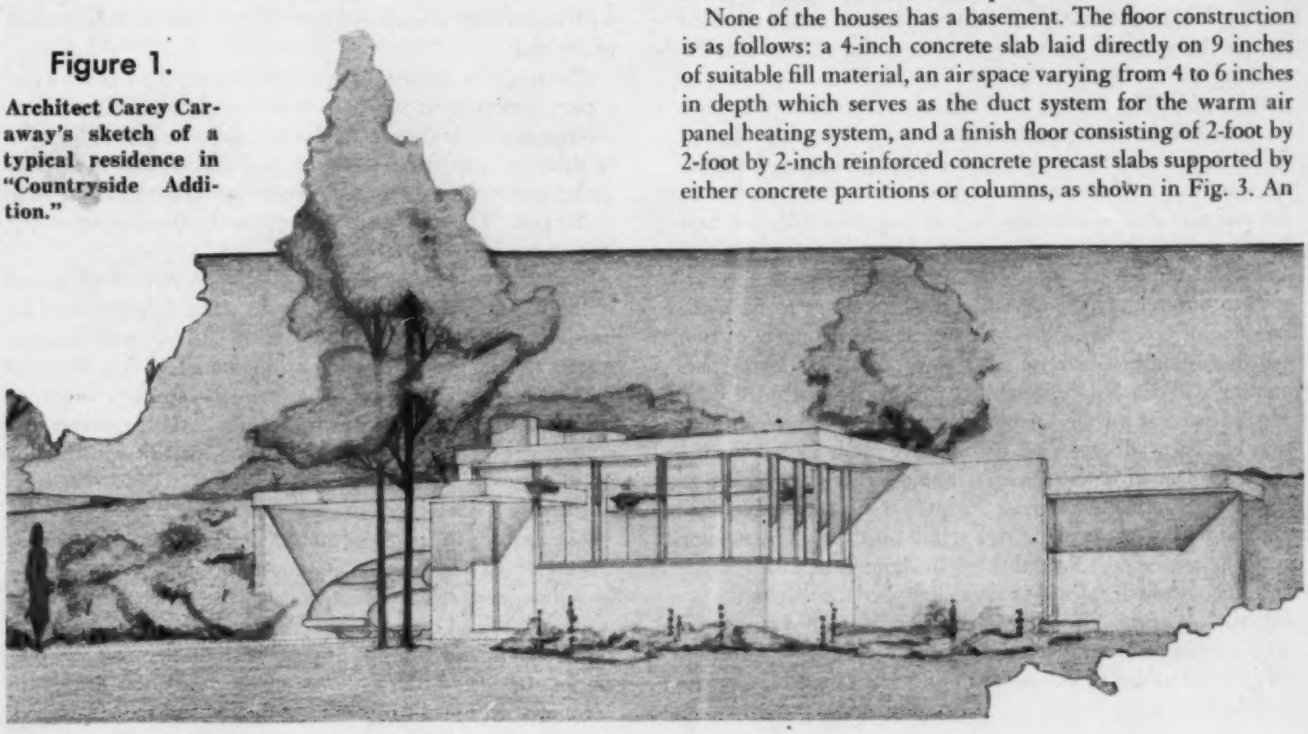
As consulting engineer for the National Builders, Inc., it was my responsibility to design a heating system that would provide the maximum comfort at a reasonable cost. The decision to employ a floor panel warm air heating system was based on the following factors (which either added to the simplicity of the design, or could be incorporated in the design to provide additional comfort):

1. Building construction utilizing insulation and vapor membrane
2. Low temperature heating
3. Uniform floor temperatures throughout occupied areas
4. Supplemental forced air heating as compensation for heat losses
5. Seasonal heating requirements correlated with solar orientation
6. Winter ventilation
7. Humidification and dehumidification
8. Air supply for efficient combustion
9. Summer ventilation and pollen control

None of the houses has a basement. The floor construction is as follows: a 4-inch concrete slab laid directly on 9 inches of suitable fill material, an air space varying from 4 to 6 inches in depth which serves as the duct system for the warm air panel heating system, and a finish floor consisting of 2-foot by 2-foot by 2-inch reinforced concrete precast slabs supported by either concrete partitions or columns, as shown in Fig. 3. An

Figure 1.

Architect Carey Caraway's sketch of a typical residence in "Countryside Addition."



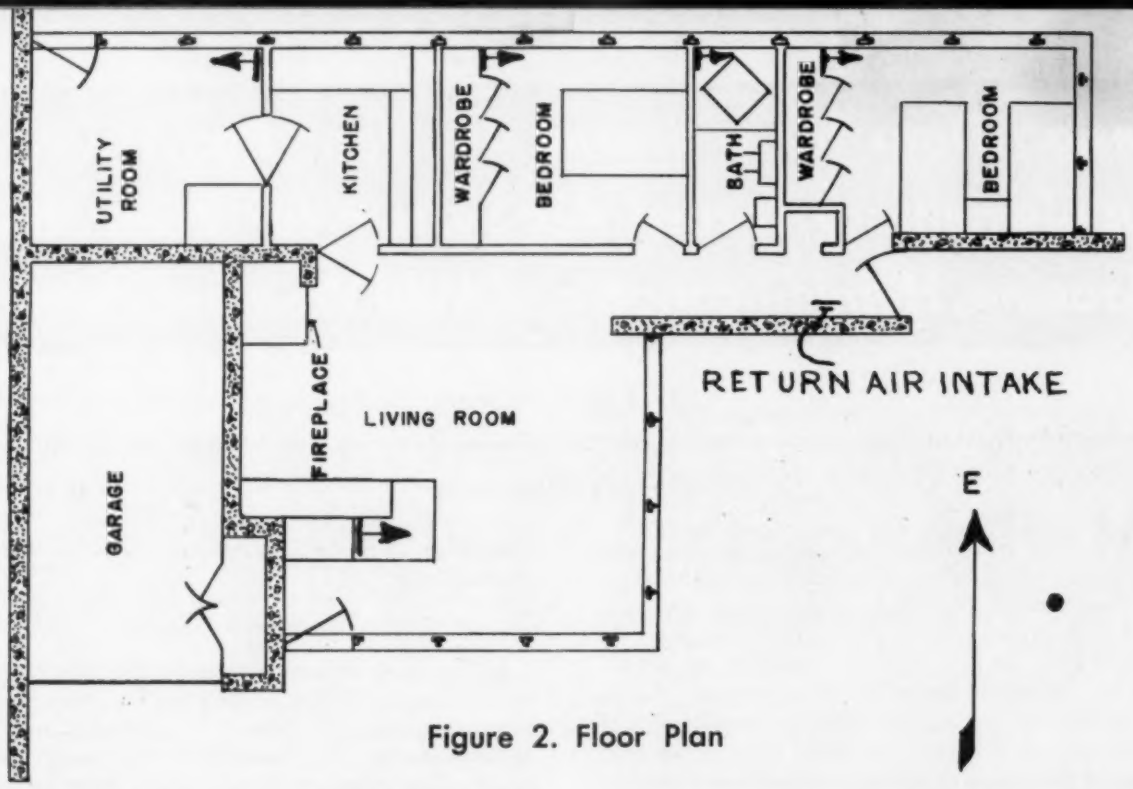


Figure 2. Floor Plan

alternate finish floor consists of corrugated aluminum sheets supported by concrete partitions or columns, reinforcing steel with the monolithic concrete either poured or applied by a jet-crete gun and a troweled finish. The concrete partitions previously mentioned serve a dual purpose in supporting the finish floor and, also, in providing a means for directing the warm air supply for the floor panel heating system. The depth of the warm air plenum is 4 inches under all the floor area except at the return air section where 6 inches is used. This design is for the purpose of keeping air velocities within reasonable limits so as to reduce both frictional and dynamic losses.

An asphalt-treated vapor resistant paper is laid on the ground *under* the 9-inch fill and is flashed up the sides of the footing wall to the floor level. (Fig. 3) This application should reduce the moisture movement through the fill, thereby increasing its insulating value and decreasing the heat loss into the ground. The footing wall extends down below the frost line and is separated from the 4-inch concrete ground slab and finish floor by a 1-inch thickness of asphalt-impregnated insulation board. The insulation board allows for expansion of the concrete slab in addition to reducing materially the heat loss that normally takes place around the perimeter of the slab and to the outside air.

Two different types of wall construction are to be used. In some of the houses, the wall construction consists of two 4-inch monolithic concrete, dry-tamped wall sections separated by a 2½-inch air space filled with rock wool insulation. Photo A shows a wall during construction before the insulation has been added. Wall sections are made in 9-inch lifts and tied together with a 2-inch wire mesh spaced 18 inches on center vertically. The outside finish is to be a white cement applied with a jet-crete gun or a splash finish. Different color schemes can be used for either application. The inside finish consists of a vapor resistant material applied directly to the inside surface of the concrete wall and then a coating of plaster. The calculated over-all coefficient "U" for the wall is .122 Btu/hr/sq ft/deg F. A coefficient of .13 was used in calculating the heat losses.

The second type of wall construction is known as jet-crete construction, patented by Mr. R. R. Colburn of the Construction Machine Co., Waterloo, Iowa. This construction (Fig. 4) consists of 1¾-inch by 2-inch wood studs spaced 16 inches on centers horizontally and supported at top and bottom by 1⅜-inch by 5⅝-inch wood plates. Twenty-four gauge metal pans which serve as a backing for the jet-crete are held in place by ⅜-inch diameter eye bolts attached to the wood studs and placed 24 inches on centers vertically. A ⅜-inch diameter vertical rod placed in the opening of the eye bolt gives added strength to the wall. A 2-inch wire mesh is stretched over the entire wall, leaving a space of approximately ½ inch between the metal pans and the wire mesh. The vertical rods, wire mesh and eye bolts are tied together with metal wire at each eye bolt. Fig. 4 shows a cross section of the wall.

The jet-crete, consisting of approximately 3 parts sand and 1 part cement with sufficient water to obtain the right consistency of mix, is then applied with a jet-crete gun (Photo B). In this operation the dry mix of sand and cement is supplied under pressure to the gun. A separate water line also leads to the gun. The gun operator controls the consistency of mix by regulating the supply of water.

The thickness of the jet-crete is 1½ inches over the entire wall area and 3½ inches at the studs. The time required for finishing one house completely with jet-crete was approximately five hours. The inside finish consists of 3¾ inches of rock wool insulation placed between the studs, a vapor resistant membrane on the warm side of the studs, a plaster base and plaster. The calculated "U" value for this construction is .107 Btu/hr/sq ft/deg F. A value of .11 was used for calculating the heat losses.

The roof construction for all of the houses is of the standard wood frame type. The ceiling construction consists of 2-inch by 6-inch joists spaced 16 inches on centers with 4 inches of insulation placed between joists. A vapor resistant membrane is placed on the warm side of joists with plaster base and plaster for the inside finish. Some of the residences are of the flat roofed type while others have the pitched roof.

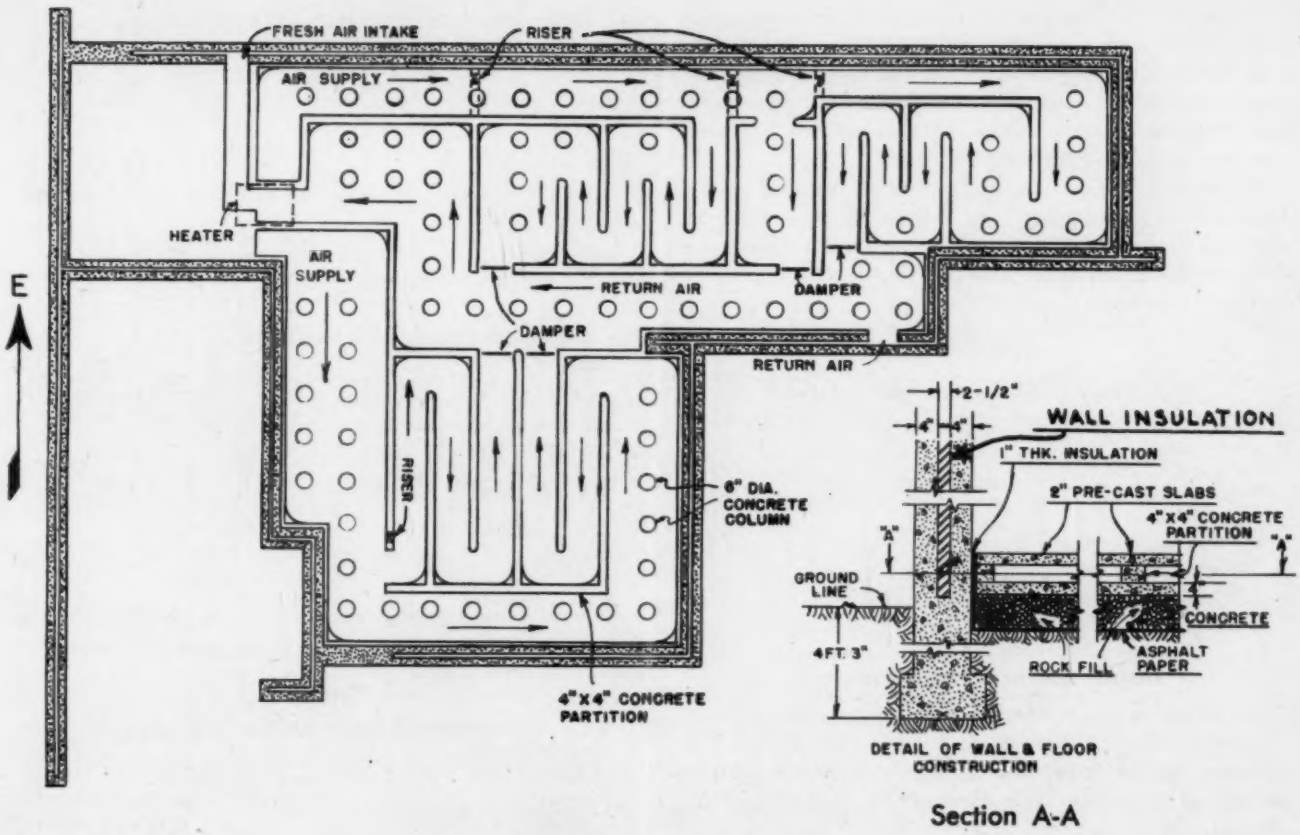


Figure 3. Plan view of air distribution system

Designing Panel System

In designing any type of heating system it is first necessary to calculate the heat losses for each room separately in order to determine the heat required to compensate for heat losses. In designing a floor panel heating system, it is also necessary to determine the *inside surface temperature* of the walls, windows, doors and ceiling in order to calculate the mean radiant temperature (MRT) of these surfaces. When the MRT is known, together with the inside air temperature and surface temperature of the floor panel, the amount of heat emitted from the floor panel by both convection and radiation can then be calculated. The following discussion illustrates the calculation procedure used for all designs.

Heat Losses

The design conditions are 70 F inside air temperature and –20 F outside air temperature. Although the 70 F inside air temperature would seem to be high for panel heating systems,

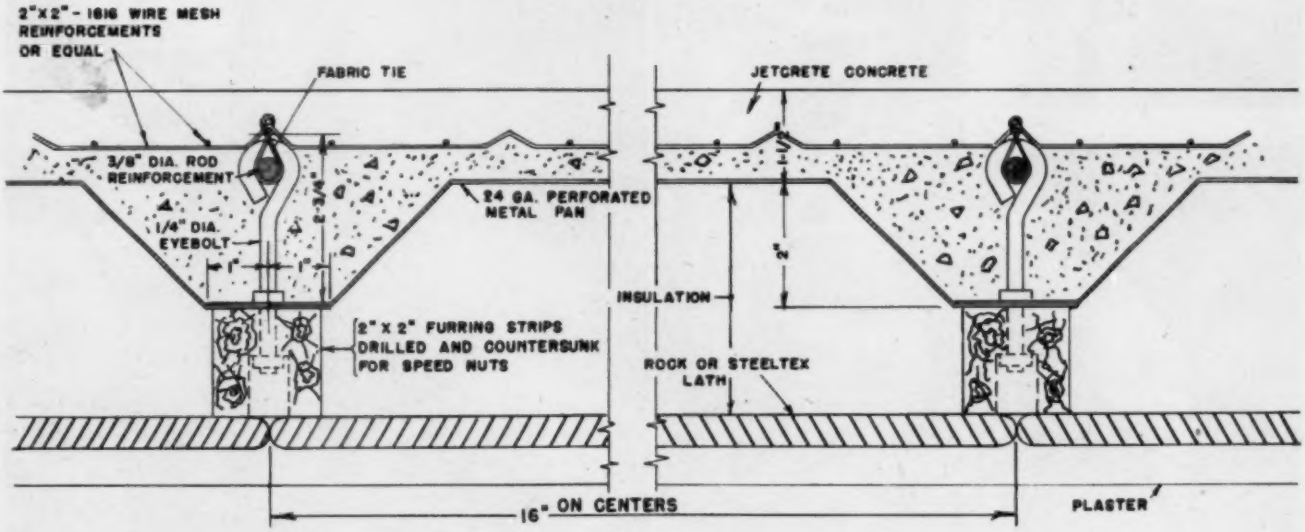

2"X2" - 1616 WIRE MESH REINFORCEMENTS OR EQUAL
FABRIC TIE
JETCRETE CONCRETE
3/8" DIA. ROD REINFORCEMENT
1/4" DIA. EYEBOLT
24 GA. PERFORATED METAL PAN
INSULATION
2" X 2" FURRING STRIPS DRILLED AND COUNTERSUNK FOR SPEED NUTS
ROCK OR STEELTEX LATH
16" ON CENTERS
PLASTER

Figure 4

Typical wall construction showing pan fastening and reinforcing support

there is no substantiating data available to my knowledge that indicates that a 68 F or lower air temperature provides the required comfort with residential panel heating systems. Most information indicates that a 70 F inside temperature is necessary if comfort is to be obtained. On this basis the 70 F temperature was selected for design purposes.

The normal transmission losses through walls, windows, doors and ceiling together with infiltration losses were determined by the method outlined in the ASHVE Guide and needs no additional explanation. Table I summarizes the calculated heat losses.

Table I

Summary of Calculated Heat Losses

Room	Btu/hr
Living room	18,441
Hallway	3,142
Bedroom No. 1	6,092
Bathroom	1,243
Bedroom No. 2	3,371
Kitchen	2,294
Utility room	4,909
Total	39,492

Inside Surface Temperature

The inside surface temperature of walls, windows, doors, etc., exclusive of the floor panel, was next determined. The following calculation for determining the inside surface temperature of the outside walls illustrates the method used for all surfaces:

Inside Surface Temperature—(Outside Walls)

$$\frac{R_1}{R_2} = \frac{70 - t_x}{[70 - (-20)]}$$

where

R_1 = resistance of inside surface coefficient $= \frac{1}{1.65} = .606$

R_2 = overall resistance of wall $= \frac{1}{.13} = 7.689$

t_x = required inside surface temperature

then

$$\frac{.606}{7.689} = \frac{70 - t_x}{[70 - (-20)]}$$

$$54.54 = 538.0 - 7.689\ t_x$$

$$t_x = \frac{483.46}{7.689} = 63 \text{ deg. F.}$$

The other inside surface temperatures should be determined by the same method, using the correct resistance values.

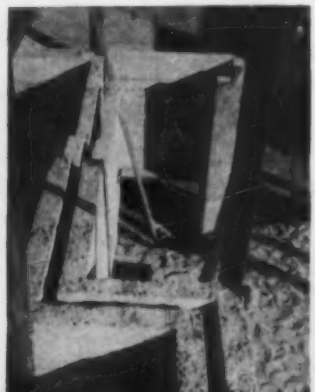
Table II

Summary of Inside Surface Temperatures

Outside walls	63.0 F
Glass	38.3 F
Doors	48.2 F
Ceiling	66.0 F
Inside walls	70.0 F

By using the curves in Fig. 5, the inside surface temperature can be found directly for any known "U" value and outside design air temperature. On the basis of this information the

Left—Photo A
Below—Photo B



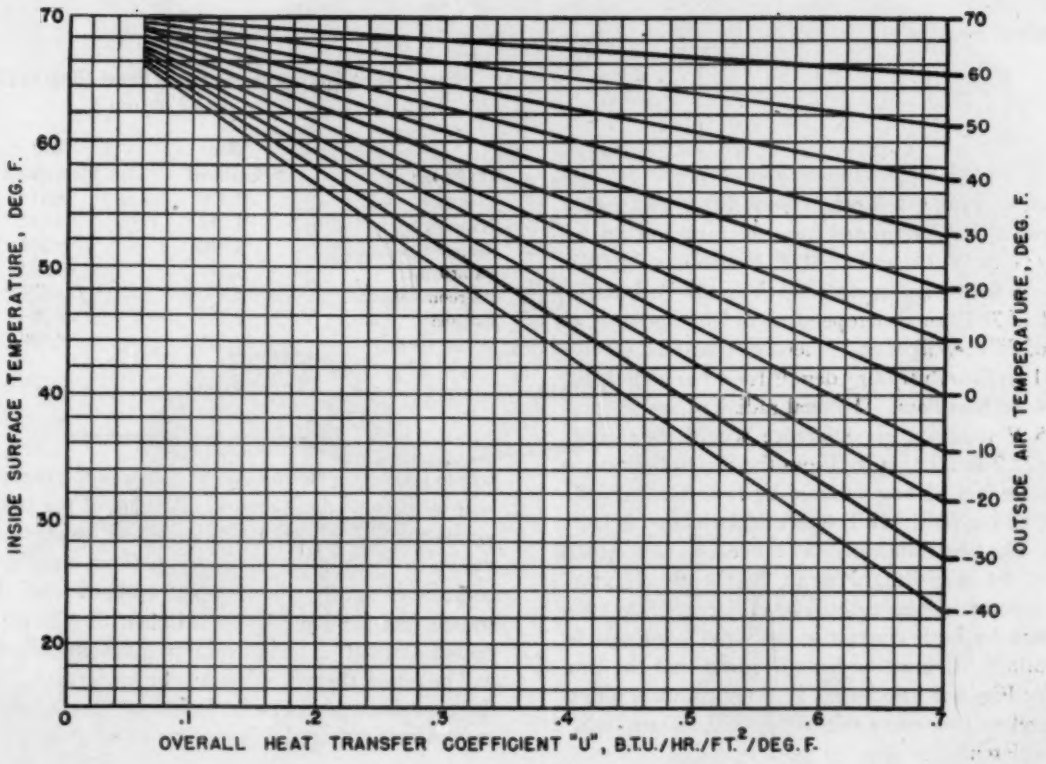


Figure 5
Inside surface temperature (inside air temperature = 70° F)

mean radiant temperature (MRT) for all surfaces exclusive of the floor panel can next be calculated.

Mean Radiant Temperature

Room	Surface	Area	Surface Temp.	Product
Living	Outside Walls	287	63.0	18,100
Room	Glass	182	38.3	6,960
	Doors	21	48.2	1,010
	Ceiling	306	66.0	20,200
	Inside Walls	180	70.0	12,600
		976		58,870

$$\frac{58{,}870}{976} = 60.2\ \text{F}$$

The same procedure is used for determining the MRT for each room.

Table III

Summary of Mean Radiant Temperatures (exclusive of floor panel)

Room	MRT (F)
Living room	60.2
Hallway	64.8
Bedroom No. 1	63.1
Bathroom	66.5
Bedroom No. 2	65.7
Kitchen	66.4
Utility room	62.4

Panel Emission

After the MRT has been determined and the design inside air temperature together with surface temperature of floor panel is known, the heat emitted from the floor panel by convection and radiation can be determined. The temperature of the panel surface is dependent upon the panel location. Generally, the following temperatures are recommended: ceiling panels, 112 F to 115 F; wall panels, around 120 F; floor panels, 85 F. A temperature of 85 F was therefore selected as the surface temperature for the floor panel.

The amount of heat emitted by radiation per square foot of floor panel is calculated by the Stefan-Boltzmans equation:

$$H_r = 0.173\left[\left(\frac{T_2}{100}\right)^4 - \left(\frac{T_1}{100}\right)^4\right] \times e \times N$$

where

H_r = heat loss by radiation, Btu/sq ft/hr
T_2 = absolute temperature of floor panel, deg F (460 + 85)
T_1 = absolute temperature of surrounding surfaces, deg F (460 + MRT)
N = angle factor, which for this condition is considered as unity
e = the emissivity coefficient which can be determined by the following equation

$$e = \frac{1}{\frac{1}{e_1} + \frac{1}{e_2} - 1}$$

where e_1 and e_2 are the emissivity coefficients for the floor panel and surrounding surfaces, respectively. In this calculation the values for e_1 and e_2 were assumed to be .85.

$$e = \frac{1}{\frac{1}{.85} + \frac{1}{.85} - 1} = \frac{1}{1.364} = .738$$

The following calculation for determining the heat loss by radiation (Btu/hr/sq ft) from the living room floor panel

shows the method used for each room.

$$H_r = 0.173\left[\left(\frac{460+85}{100}\right)^4 - \left(\frac{460+60.2}{100}\right)^4\right] \times .738 \times 1$$

$H_r = 19.2$ Btu per hour per square foot of floor panel.

The amount of heat given off by convection per square foot of floor panel was determined from the results of the investigation by G. B. Wilkes and C. M. F. Peterson on "Radiation and Convection from surfaces in Various Positions".[1] Using a MRT of 70 F, an air temperature of 70 F and a panel temperature of 85 F, Wilkes and Peterson reported a surface coefficient of 1.88 Btu/sq ft/ hr/ deg. F for a horizontal surface with upward heat flow. The total radiation and convection for a 15 F temperature difference would then equal $15 \times 1.88 = 28.2$ Btu/hr/sq ft. From the Stefan-Boltzmans equation, the amount of heat emitted by radiation for a 85 F floor panel and a 70 F MRT was calculated to be 11.97 Btu/hr/sq ft. The heat transmitted by convection would then be $28.2 - 11.47 = 16.23$ Btu/hr/sq ft. By the use of curves in Fig. 6, the amount of heat emitted by radiation or the total amount of heat by both convection and radiation can be readily determined. It must be kept in mind that the convection loss for Fig. 6 is based on a 15 F temperature difference, and therefore this curve cannot be used for any other temperature difference.

Calculated Floor Emission

After the total amount of heat (Btu/hr/sq ft) that can be emitted from the floor panel has been determined, it is then necessary to determine the amount of heat required from the floor panel to compensate for the room heat loss. This value is readily determined by dividing the room heat loss (Btu/hr) by the square foot of effective floor panel surface.

Floor Heat Shortage

Where large glass areas are used, it is generally true, especially where the outside design temperature is –20 F, that sufficient heat cannot be supplied from the floor panel to take care of the room heat losses and still maintain a surface temperature of 85 F for the floor panel. As all of the residences in Countryside Addition make use of large glass areas to add spaciousness to the room and for solar orientation, it was necessary to include in the design means for supplying supplemental heat to some of the rooms to take care of the heat losses and to maintain comfort conditions. The calculated values as shown in Table IV indicate that with an outside design temperature of –20 F, the total heat emitted from the floor per square foot per hour is not sufficient to take care of the required amount. The last column gives the difference and, as will be noted, there is a shortage for each room. Table V gives the total shortage in Btu for each room; the amount of supplemental heat required is based on these figures.

[1]G. B. Wilkes and C. M. F. Peterson, *"Radiation and Convection from Surfaces in Various Positions"*, ASHVE Transactions, Vol. 44, 1938.

Table V

Total Heat Emitted and Total Heat (Btu/hr) Required from Floor Panel

Room	Btu Emitted	Btu Required	Btu Shortage
Living room	10,000	18,441	—8,441
Hallway	1,282	3,142	—1,860
Bedroom No. 1	3,920	6,092	—2,172
Bathroom	1,050	1,243	— 193
Bedroom No. 2	3,250	3,371	— 121
Kitchen	2,155	2,294	— 139
Utility room	3,340	4,909	—1,569
	24,997		

Ventilation

The ventilation needed for proper removal of smoke and odors must be considered in designing for comfort conditions. The outside air entering the house by infiltration was calculated to equal .40 of an air change per hour. Although this amount would be sufficient for normal conditions, additional outside air would be required when the number of occupants and activities increased. The outside air supply was increased, therefore, to obtain a total .80 of an air change per hour through an outside air intake which supplies an additional 40 cfm. The heat required to bring this air to inside conditions would be an additional heat load. This load was calculated as follows:

$40 \times 60 \times .075 \times .24\,[70 - (-20)] = 3960$ Btu/hr.

Heat losses to the ground would be an additional heat load. Although the heat loss through a concrete slab laid on the ground might be greater than the heat loss through a basement floor, a "U" value of .10 Btu/hr/sq ft/deg F was used in calculating this loss. The calculated mean air temperature for

Table IV

Maximum Amount of Heat (Btu/sq ft/hr) Emitted from Floor Panel for Calculated Mean Radiant Temperatures (85 F Floor Panel and 70 F Air Temperature)

Room	Mean Radiant Temp.	Temp. Diff. Convection	Temp. Diff. Radiation	Convection	Radiation	Total Emission	Required Emission	Shortage
Living room	60.2	15	24.8	16.23	19.2	35.43	65.5	—30.07
Hallway	64.8	15	20.2	16.23	15.8	32.03	78.5	—46.47
Bedroom No. 1	63.1	15	21.9	16.23	16.1	32.33	50.2	—17.87
Bathroom	66.5	15	18.5	16.23	14.6	30.83	36.6	— 5.77
Bedroom No. 2	65.7	15	19.3	16.23	15.1	31.33	32.4	— 1.07
Kitchen	66.4	15	18.6	16.23	14.5	30.73	32.7	— 1.97
Utility room	62.4	15	22.6	16.23	17.5	33.73	49.6	—15.87

Average Emission in Btu/hr/sq ft of floor area = 32.3

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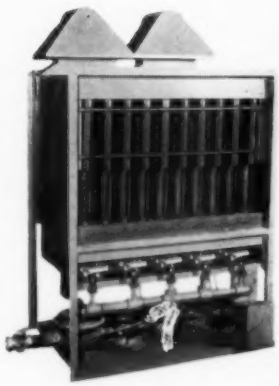

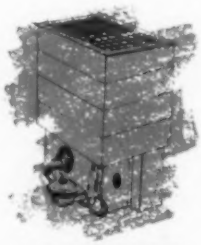

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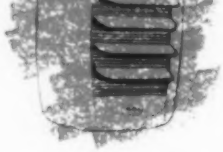
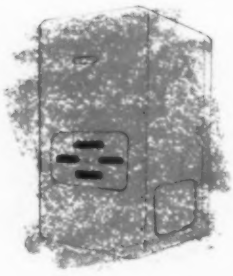


SUSPENDED UNIT



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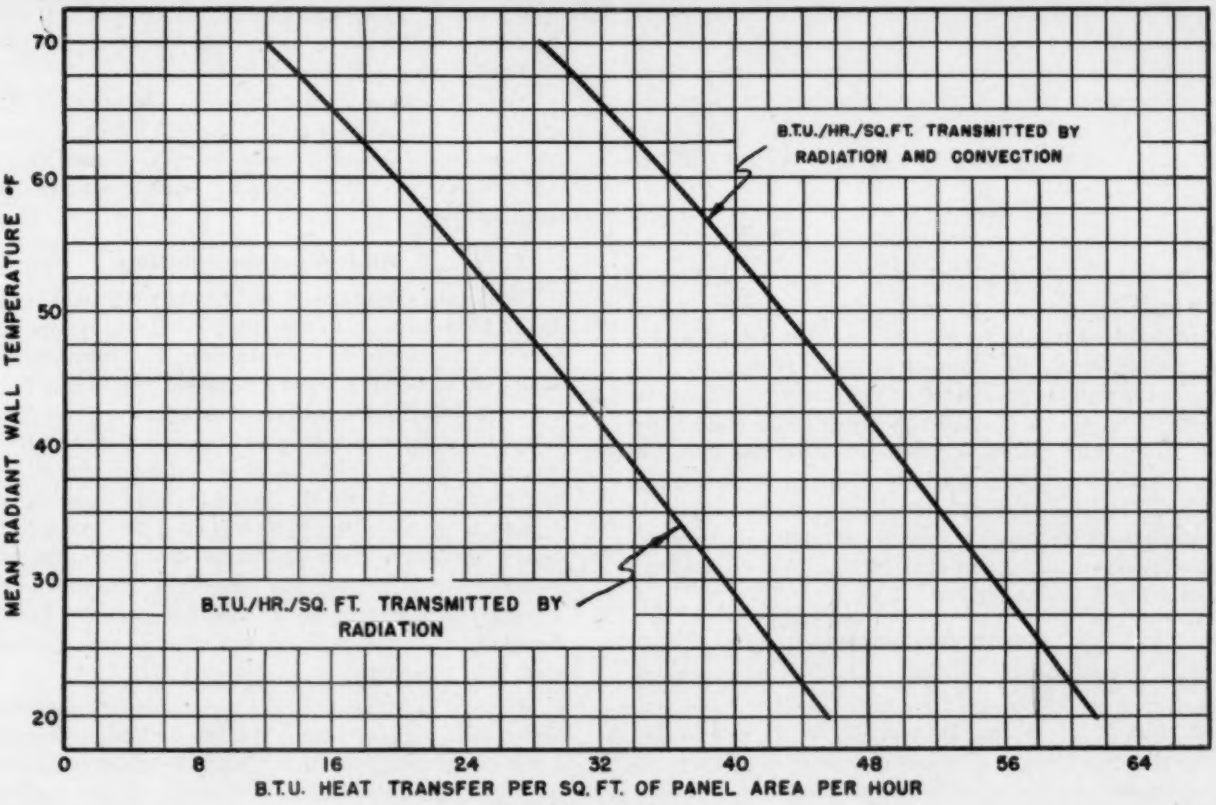


Figure 6

Heat transfer from a floor panel (panel surface temperature 85° F, air temperature 70° F)

the warm air supply was found to be 110 F. With an assumed ground temperature of 50 F, the heat losses to the ground were determined as follows:

Heat loss to the ground = Slab area in sq. ft. × "U" × temp. diff.

Heat loss to the ground = 961 × .10 (110-50) = 5770 Btu/hr.

The total heat loss or heating load would be the sum of the transmission and infiltration losses, ventilation losses and losses to the ground; or:

Transmission and infiltration losses	= 39,492
Ventilation losses	= 3,960
Losses to the ground	= 5,770
Total	49,222 Btu/hr

Panel Air Distribution

As previously mentioned, a floor panel warm air heating system is to be used in all residences in the project. This method of heating can be classified as low temperature heating because the entire floor area is to be maintained at approximately 85 F and should provide uniform heat distribution to all of the rooms. As the major heat losses occur along the outside walls and at the perimeter of the floor slabs, the main trunk duct from the furnace is divided into two separate supplies (See Fig. 3).

The warm air for each supply flows first along the *outside walls* and is then directed through channels (similar to a serpentine coil) under the main part of the room floor, back to a common return and then to the furnace. Free-swinging, heavy plate dampers are located at the return outlet from each room for volume control. Dampers are made of ⅜-inch thick steel plate and swing in the direction of air flow. Access plates are located in the wardrobe partition walls to provide a means for adjusting dampers. After the system has been balanced, it should not be necessary to make additional adjustments. Volume control dampers are to be installed also in each supply circuit at the furnace outlet.

Air Volume Determination

In order to determine the volume of air required it is first necessary to calculate the supply mean air temperature. This procedure is as follows:

Mean Temperature of Supply Air

Design floor temperature = 85 F

Assumed inside air temperature = 70 F

Average Btu/hr given off per sq. ft. of floor area (Table IV) = 32.3

then:

$$f_1 = \frac{32.3}{15} = 2.16 \text{ Btu/hr/sq ft/deg F}$$

$$R = \frac{1}{2.16} = .463$$

$$R_1 = \frac{1}{2.16} + \frac{2}{12.0} + \frac{1}{2.0} = 1.130$$

$$\frac{R}{R_1} = \frac{t_1 - t_a}{t_x - t_a} \quad \text{or} \quad \frac{.463}{1.130} = \frac{85 - 70}{t_x - 70}$$

$$.463\, t_x - 32.4 = 16.97$$

$$t_x = \frac{32.4 + 16.97}{.463} = 107 \text{ F (Mean air temperature)}$$

A mean air temperature of 110 F was used in all calculations with a 20 F temperature drop. With the mean air temperature known together with the assumed temperature drop, the required air volume could then be determined. The usual procedure for determining the cfm required would be as follows.

$$\text{cfm} = \frac{49{,}222}{60 \times .24 \times .069\ (120\text{–}100)} = 2480 \text{ cfm}$$

Additional attention to the heating load requirements and also to details of the design will indicate that this calculated cfm is considerably in excess of actual requirements. The heat loss through the ground would not necessarily have to be considered in the total cfm requirements. Increasing the temperature of the heated air, which is first directed along the outside walls where the major losses occur, by approximately 5 F would be as effective as increasing the volume of air. As the area around the outside walls is comparatively an unoccupied space, an increase in floor surface temperature there would not be objectionable.

Forced Air System

Of the total transmission, infiltration and ventilation losses, exclusive of ground losses, amounting to 43,452 Btu only 24,997 Btu (Table 5) can be supplied by the floor panel. Rather than heating the utility room by means of a floor panel, it is more desirable to supply heated air directly to this room as required. Therefore, the total Btu to be supplied by floor panel would be $24{,}997 - 3{,}340 = 21{,}657$ Btu. The difference, $43{,}452 - 21{,}657 = 21{,}795$ Btu is supplied by directing heated air through wall registers into the required rooms. In determining the air volume required, it must also be kept in mind that of the 21,795 Btu, a 3960 Btu requirement is due to outside air for ventilation needs.

The following calculations show the method used in determining the total cfm, as required.

1. $\text{cfm} = \dfrac{21{,}657}{60 \times .24 \times .069\ (120\text{–}100)} = 1082 \text{ cfm}$ (floor panel)

2. $\text{cfm} = \dfrac{21{,}795 - 3960}{60 \times .24 \times .069\ \ (120\text{–}65)} = 326 \text{ cfm}$ (register supply)

3. $\text{cfm} = \dfrac{3960}{60 \times .24 \times .075\ (70\text{–}(20))} = 40 \text{ cfm}$ (ventilation)

Total cfm $= 1082 + 326 + 40 = 1448$ cfm

The air velocities vary from approximately 800 fpm to 300 fpm. The higher velocities are used to supply circuits along outside walls and the lower velocities for the major part of the floor in each room. In this design, the supplemental heat equivalent to 326 c.f.m. is to be supplied by high side wall registers. A sheet metal wall stack connects the warm air plenum under the floor to each register. (Figs. 2 and 3.)

As the static pressure in the chamber underneath the floor is positive on the supply side and atmospheric in the rooms, heated air can be readily supplied directly to any room. Volume control dampers are located in each register. A baseboard return grille is located in the hallway and directly connected to the return circuit in floor panel. The room return air will then flow through the return register to the return circuit under the floor and back to the furnace as in any mechanical warm air heating system. The locations of dampers, risers, registers and warm air supply and return circuits are shown in Figs. 2 and 3.

The heating plant consists of a mechanical warm air furnace with bottom inlet and top outlet, complete with air filters, fans and automatic controls. Propane gas is to be used as a fuel; this can also be used for cooking and domestic hot water heating.

Mild Weather Heating

The heating requirements during early fall and late spring should be considered in designing a heating system with a floor panel, concrete slab construction. There are many days during these seasons when it is desirable only to take the chill out of the air. If it were necessary to heat the entire concrete floor slab in order to supply the required warmth early and late in the day, the time lag of several hours caused by the heat storage capacity of the concrete would result in underheating at the time heat is most needed and in overheating during the warm, sunny part of the day. Again, the supplemental forced air heating system becomes a practical necessity. Through the wall registers it is possible to supply heated air directly to the rooms within a few minutes after the heating plant is in operation.

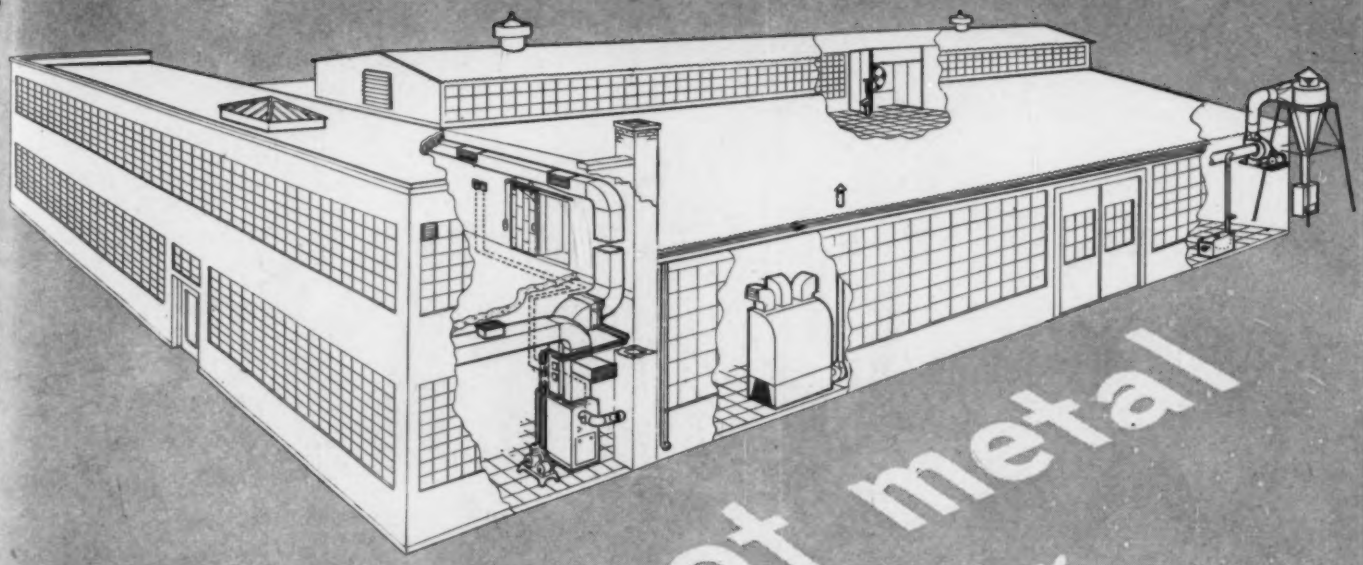
The use of tight building construction, vapor resistant membranes and weather stripping presents in these modern houses a problem of ventilation that needs to be given consideration. Although the amount of air infiltration in any residence is sufficient to take care of the oxygen requirements of the occupants, the problem of odors, smoke, etc., can best be solved by supplying additonal outside air. This feature is incorporated in the design as shown in Fig. 3. A screened 12-inch by 12-inch intake register facing downward is located in the horizontal plane of the eave or roof overhang. This location eliminates any problem of snow or rain entering the fresh air intake. A 12-inch by 6-inch duct with a well-fitted damper for volume control connects the register to the return side of the furnace. The outside air supply is properly conditioned before being admitted to the rooms.

The proper relative humidity is not only an important phase of comfort conditions but also of building structure and furnishings. Humidity, when necessary, is to be supplied by the supplementary forced air system with a humidifier as an integral part of the furnace. Many instances have been reported when an excessive amount of moisture was present. This is most common in sub-zero climates and can be caused by a combination of sudden drop in outside temperature, tight building structure, the use of vapor membranes and ordinary living conditions. A simple means of control is obtained by admitting relatively dry, heated air. The outside air intake together with the setup for supplying supplemental heat can also be used for this control and has been sized to supply 400 cfm of air if needed.

Combustion Air

Likewise, the need for a positive air supply for combustion requirements must be given consideration. This is especially true in house construction without basements and where the heater or utility room is so located that the amount of air infiltration is not sufficient to take care of the air requirements for efficient combustion. This need is taken care of by supplying a minimum of 20 cfm of heated air to the heater room in the same manner as used in supplying supplemental heat. The

(Continued on Page 254)



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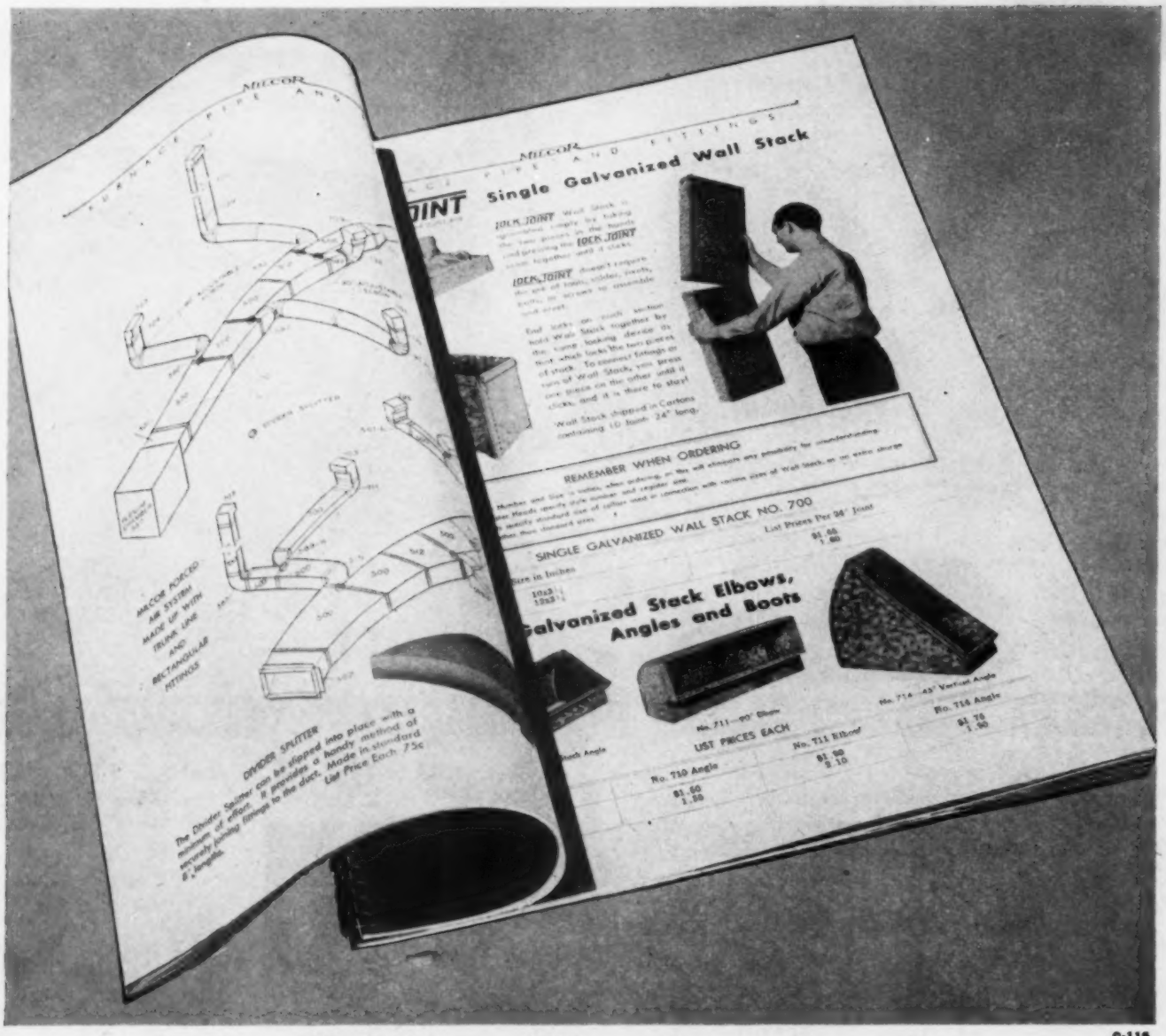
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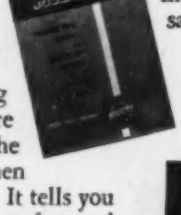

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MACHINERY WORTH QUARTER-MILLION BUILDS BUSE'S SHIP OUTFITTING REPUTATION

By
R. C. Nason

ONE of the large sheet metal fabrication shops in the Manhattan area is that of Fred Buse, Inc., Long Island City, and this article will discuss the plant and its methods of production. Size of this organization is indicated by the fact that it has two floors in the plant, each of 10,000 sq. ft. The machinery and equipment in the plant is valued at $250,000. Extensive use is made of shears and brakes in metal forming and a great deal of arc welding is done in processing the many products turned out.

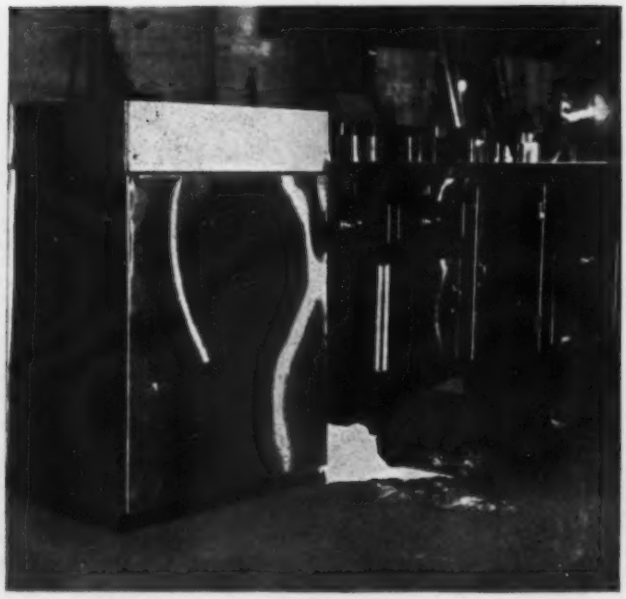
The plant is housed in a two-story brick building, owned by the contractor, and from the beginning planning was evident in the arrangement of the two floors. Sheet stock deliveries are made direct to the basement by means of a truck ramp and material of all types is stored on this lower floor. A great deal of the primary braking and shearing is done on the lower level.

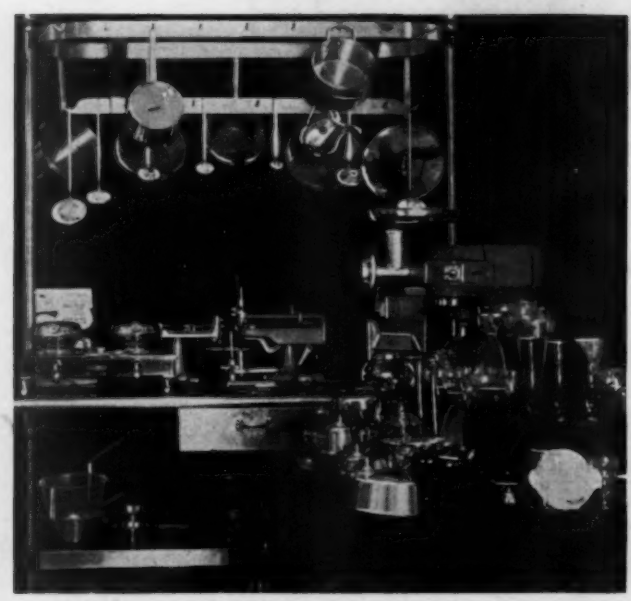
After the preliminary work has been done in the basement the materials are sent to the main floor for further processing and finishing. An elevator is used for this purpose. Study of the floor plans will indicate that a logical material flow has been developed in this firm in which fabrication of such parts as sinks, tables, cabinets, and range hoods is accomplished in one section of the shop and painting and shipping are done in another section. With an arrangement of this type there is little backtracking in the production process.

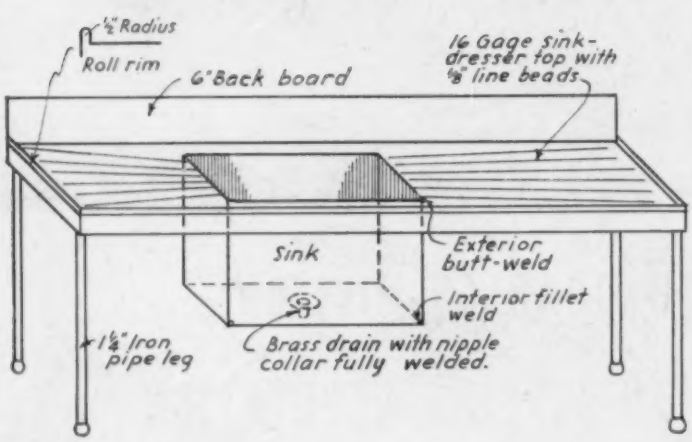
Type of Work

The lighter gauges of metal are not ordinarily handled by this contractor since most of his work (galley equipment being a specialty) lies in the heavier industrial field and calls for metal between 12 and 22 gauge. Stainless steel and "stretcher-level" cold rolled sheet steel account for the greatest percentage of material used in the Buse plant. In equipping an average galley, sinks and tables are made of stainless steel, cabinets of galvanized and range hoods of "black iron." This complies with general practice in the area.

Ship outfitting has long been a major work of this shop and that, of course, entails a great deal of custom work. It is this custom work, as opposed to standardized production runs, that prevents the use of as many jigs and fixtures as would



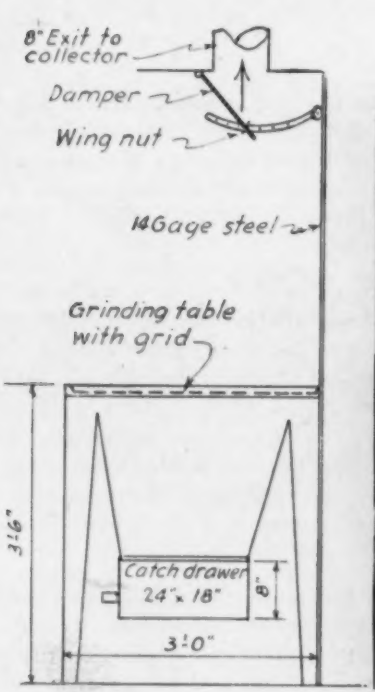


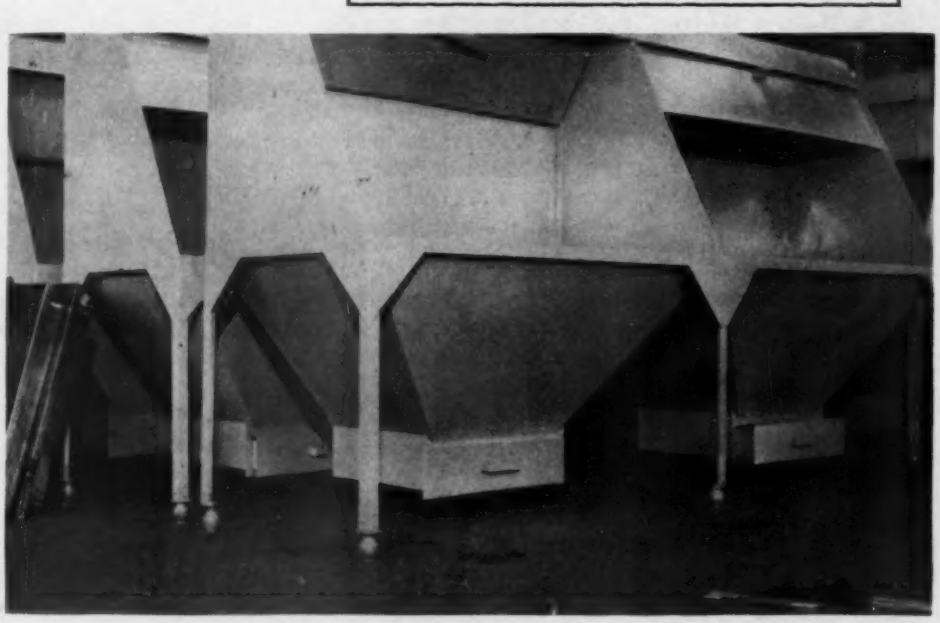


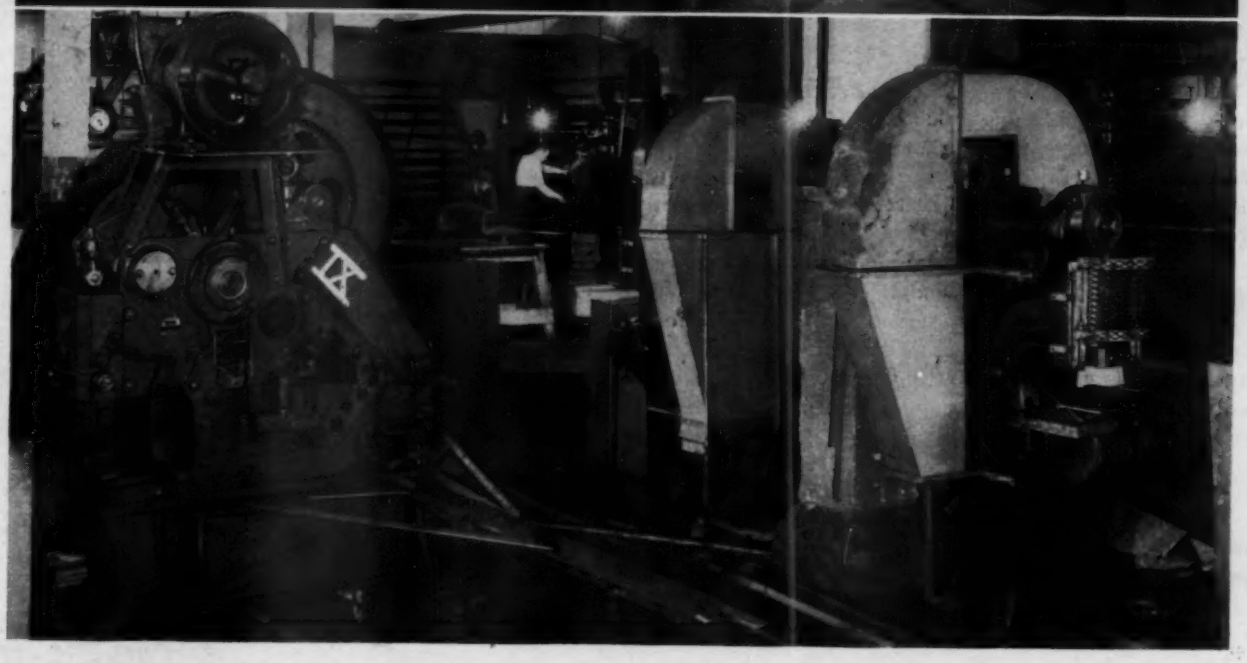
PHOTOS

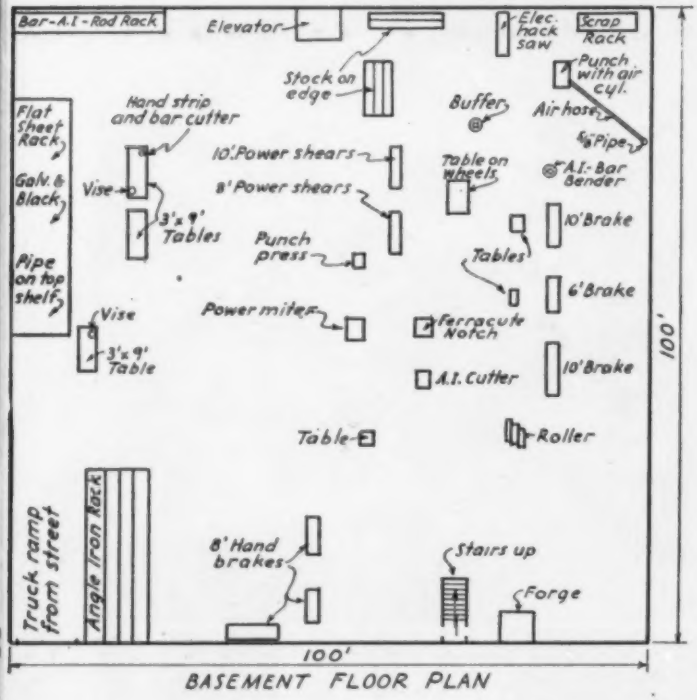
This Page (Counter-Clockwise)—A view of an assortment of Buse products; A bar worktable made for a luxury cruise ship; A galley sink made with a stainless steel top; Below is a a dimensioned drawing and a picture of a dust-collecting table made for grinding castings.

Opposite Page—Top—Turning up the side of a dough box in Buse shop; Center—Arc welding being done on roast pans and a pyrotechnic locker, at the right; Bottom—Part of the shear and brake section of this shop.









BASEMENT FLOOR PLAN

ordinarily be used in a plant of this size. A contract was recently completed for the U.S. Shipping Board that involved converting troop transports to pleasure-cruise vessels. This order required the fabrication of several hundred deck refreshment tables of 3 and 4 ft. diameter. Material used was 16 gauge stretch steel and it was necessary that the table tops be designed to receive a covering of 3/16 in. linoleum.

First step in the production process of these tables was cutting out the discs on a Libert circular cutter, a machine with a 3-ft. throat. Then separate side rims 1¼ in. wide were sheared and rolled to a half-circle, two pieces making the complete rim. These side rims were then tack welded to the discs for alignment and then finish welding was done.

Next step was shearing and flanging 90-deg. retainer rim pieces which were designed to receive the circular linoleum tops. These rings were then welded to the side rims on the tables with the top flange positioned so the linoleum could be slipped into place quickly and easily. The advantage of this type of construction is that the top covering can easily be replaced, when worn.

Since the preceding job was made of stretcher-level steel, it would be well to discuss a product made of stainless steel. One style of sink top is fabricated of 16 gauge stainless, underflanges are welded on and carefully ground and polished to make the joints invisible. Table backers, such as those on dish drain tables, are brake formed with round interior corners and a radius of approximately ¼ in. This prevents moisture deposits and permits easier cleaning. The same type of fillet is usually put into a vertical corner, not only for the reasons stated but to reinforce the joint. These fillets are fashioned in various ways; of solder with a high tin content, of welding rod and sometimes of special stainless steel preformed fillets, welded in.

Production Helps

The grinding of welded joints and the finish polishing of material is rather necessary in sheet metal work for kitchen use, principally from the standpoint of appearance. So, in addition to 10 portable arc welders, this particular contractor has an equal number of portable grinders and buffers. Portable equipment is used because of the size of the products made; it becomes difficult to position a double-drainboard sink, 12 feet long, into a machine. It is a little easier to bring the equipment to the job.

Other Types of Work

Production in the Buse plant is not restricted to galley equipment, however, as a recent job completed for a New Jersey manufacturer of railroad material would indicate. The order called for 24 work tables for grinding castings, they were fitted with grill work as a working surface and had full width exhaust hoods with an adjustable damper. Beneath the grill work the table tapers down to an opening into a drawer for easy removal of the heavy particles.

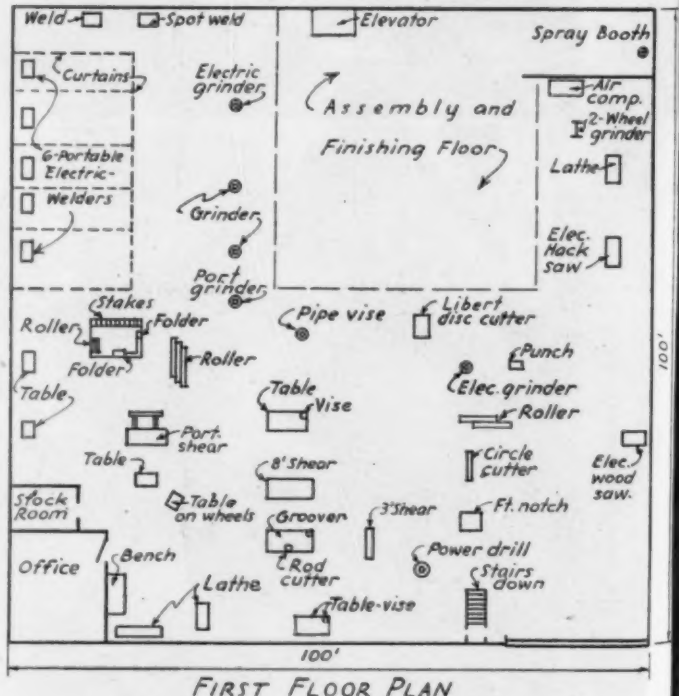
Another job processed in the shop was a 40-ft. kitchen exhaust hood, utilizing sectional grease-catching filters. This was being made for a Long Island resort hotel that was completely renovating its kitchen. Material used was 14 gauge stretch level steel and the hood was to be painted in the convenient paint spray cabinet in the plant.

Equipment Features

All the machine tools in the Buse plant are clearly identified with large white numbers for inventory and accounting purposes. In recording working time it is much better to refer to a machine number than to name the machine.

This shop uses a rigid air line from its compressor to the localities requiring air since far less maintenance is encountered with a rigid line than with the use of rubber hose.

One air line is run to the paint spray booth for use with the spray guns and the other main line goes to the lower floor where one of the presses has been equipped with an air cylinder. This addition obviously increases output and reduces worker fatigue and is one of the most important means of increasing man output-per-hour in a shop of this type.



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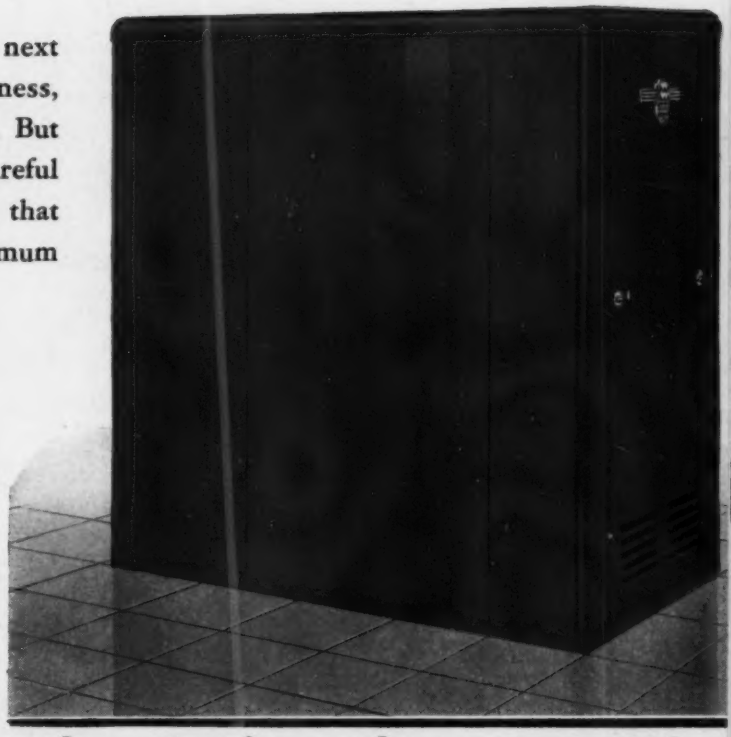

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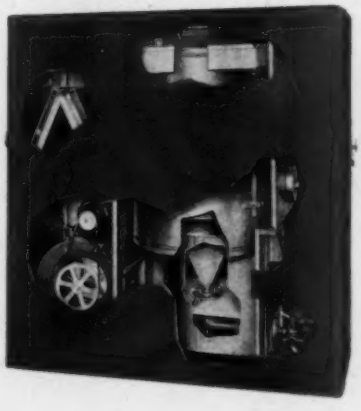

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This is a real gas air conditioner, designed specifically for the fuel it burns — gas. It is engineered for economy of operation, yet nothing has been omitted to provide home heating comfort. Equipped with the latest development in quiet, efficient burners. As for the casing — it would be a source of pride in any basement.

Can be furnished for Butane and Propane.

7 sizes . . . . . 90,000 to 240,000 BTU per hour

There is a Waterbury for every size home and every type fuel.

Waterbury

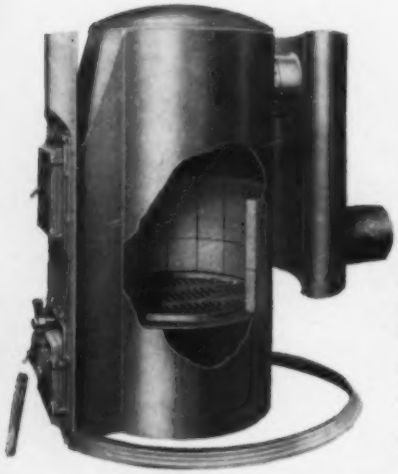
OIL FIRED AIR CONDITIONER

Completely automatic oil heat and filtered, automatically humidified air combine to give the utmost in home heating comfort. Designed with meticulous care—built by precision methods.

Easy access is provided to all parts that might need to be reached, and the casing is so designed that it may be placed in any position in the basement.

3300 Series, 1 size . . . . . 97,000 BTU at bonnet
2300 Series, 1 size . . . . . 145,000 BTU at bonnet
1300 Series, 6 sizes . . . . . 170,000 to 425,000 BTU at bonnet

Cut-away View
Oil Fired Air Conditioner
3300 Series



The 700 Series Gas-Tite Body

GAS-TITE *Hand Fired* FURNACE

Where a hand fired, coal burning, gravity job is desired, there is no better answer than the time-tested Waterbury Gas-Tite. The welded, all-steel furnace body permits no gases or dirt to get into the air stream.

4 sizes . . 20 in., 22 in., 24 in., 27 in.

GAS FIRED GRAVITY FURNACE

Here is the last word in a gas furnace that is built from the floor up as a gas furnace. The same safe, efficient burner, the same welded all-steel body, that are used in the Waterbury Gas Air Conditioner.

Can Be Furnished for Butane and Propane.

4 sizes . . . . . 90,000 to 240,000 BTU per hour

Cut-away View
Gas Gravity Furnace
6400 Series

CONVERSION GAS BURNER

This is not just a gas port put into a furnace, but the same carefully designed, precision built burner used in all Waterbury gas fired units.

Attractively designed, it is compact and mounts close to the furnace, taking up very little additional space. The ideal answer to automatic heat for the home with a good heating plant already installed.

Can Be Furnished for Butane and Propane.

1 size . . . . . 165,000 Maximum BTU Input

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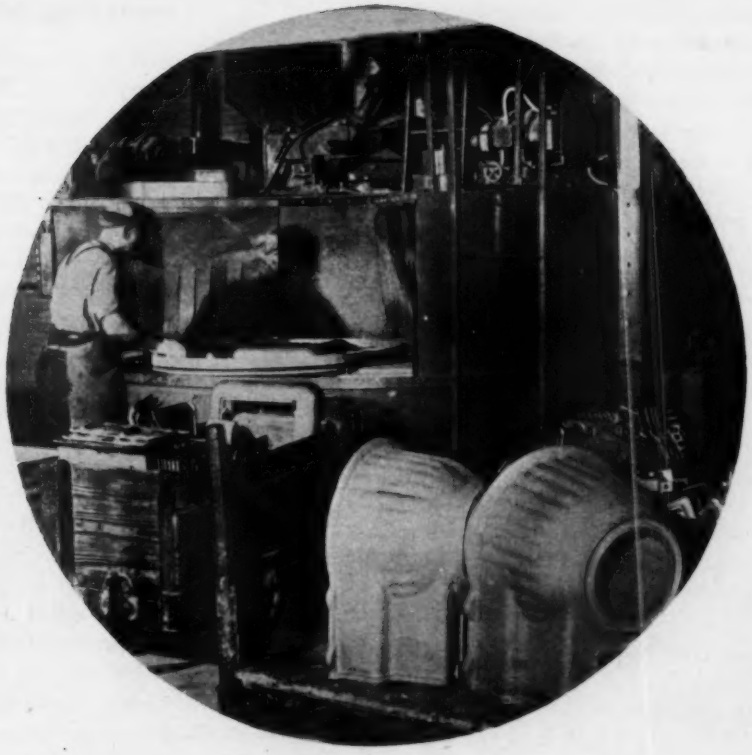


Cleaning Metal For Finishing

By
Stanley Dingman

WHEN it comes to the finishing of metal products, beauty is more than skin deep. No matter how well formulated or carefully applied the finish may be, it will provide neither the beauty nor the service expected of it if the metal underlying it has not been conditioned to receive that finish. That conditioning is thorough cleansing and degreasing to remove oils, tempering materials, oxidation products, and polishing and buffing compounds, and it is safe to say that no metal parts or pieces should be sent to the finishing room until they have been properly cleaned of all foreign matter. If this is not done, the soil will act as a mechanical barrier between the finish and the metal, and the bond between the two will be neither firm nor permanent. Then, too, there is likely to be a chemical reaction which, in a short time, may spoil the appearance of the finish as well as cause it to flake, peel, or lift off.

Cleaning and degreasing is, then, a matter of great concern in all metal finishing operations. Actually, it can be considered as the first step in the finishing procedure, and, as such, it is just as important in its own way as are the application, the drying, or the baking of the finish. This does not imply, of course, that a thorough cleaning of the parts before finishing will compensate for incorrect selection of the coating material or for faulty technique in applying it. But, on the other hand, it would be impossible to get a satisfactory finish even though the materials and techniques were the best, if the metal were not thoroughly cleaned.

There are available to the practical finisher many methods of cleaning and degreasing metals whether they be steel, iron, brass, copper, or aluminum, and each of the methods has individual advantages which suit it to varying conditions and uses. Chief among the presently used methods are blast cleaning, airless blast-cleaning, and liquid solvent cleaning. The cleaning process must, however, be engineered for the perticular job in hand for, as is easily recognized, the problem of cleaning and degreasing locomotive running gear would require a totally different technique from that of cleaning the gears and wheels used for watchmaking. The stripping of paints, lacquers, enamels, and electro-deposits from metal parts which are to be refinished, would, necessarily, require still other modifications. In determining the proper equipment and cleaning compounds, one must, then, take into consideration the kind of metal to be cleaned, the type of oil, grease or other foreign matter to be removed, the volume of work and the cleaning speed desired.

Solvent Degreasing

Degreasing is one of the major factors in the cleaning of most metal surfaces for during the various forming and shaping operations, oils or greases of one type or another are often used as lubricants. These oils and greases are, in themselves, antipathetic to any subsequent finishes because

they prevent adhesion and firm bonding of the finish to the metal. They also tend to gather and hold dust, dirt, metal chips, and other foreign matter which, if left on the metal, make it impossible to achieve a good finish.

Most metal degreasing now is done with chlorinated hydrocarbon solvents such as carbon tetrachloride, tetrachlorethylene, and trichloroethylene, the latter being the most widely used of the three, because it is more easily stabilized than the others. Proper stabilization is essential to prevent breakdown of the solvent and consequent release of free hydrochloric acid which would in turn attack the metal. Usually, of course, the degreasing solvent is stabilized to the proper degree by the manufacturer so that the stabilizer is present in both the vapor and liquid phases of the solvent. Thus, there seldom is any reason to worry about solvent breakdown due to reaction with moisture, air, or the metals being cleaned, and if the degreasing equipment is operated properly there is little danger of breakdown from excess heat or exposure to light. However, the operator who wishes to keep a check on the stabilization of his solvent can do so by means of a simple method of testing alkalinity.

Test for Alkalinity

To run this test one needs only some inexpensive chemicals and glassware, including a burette, which is a graduated glass tube fitted with a stopcock. This burette is filled with one-tenth normal hydrochloric acid, a solution containing 3.65 grams of hydrochloric acid per liter (1000 cc.). This is added, in small quantities, to a mixture of 100 cc. of the solvent and 100 cc. of distilled water which have been thoroughly shaken together, and in which a few drops of methyl orange indicator have been placed. After each addition of the acid, the entire mixture should be shaken thoroughly until the pink tint disappears. When this tint refuses to disappear on thorough shaking, it indicates that the entire mixture has an acid reaction, and the amount of acid solution required to give this reaction is an indication of the stability of the solvent.

In other words, the solvent should normally have a very low alkalinity if it is properly stabilized. Therefore, a small quantity of acid is all that should be required to shift the acid-base balance to the acid side. If a considerable volume of the acid solution were needed to give the permanent pink tint, it indicates that the solvent is too alkaline and therefore relatively unstable.

Important as is the selection of a properly stabilized solvent, operators of degreasing equipment are probably more interested in ways of conserving the solvent, for the manufacturers can be depended upon to furnish properly compounded solvents if they know the nature of the work being done. The elimination of solvent loss to ensure economical operation, however, is an on-the-spot task which may require some thought and study.

First of all, it must be remembered that the chlorinated hydrocarbon solvents are volatile, and further, that most degreasing equipment is designed so that heated solvent vapors condense on the work being cleaned. This is done so that the grease and soil carried off by the solvent cannot contaminate subsequent work loads. Thus, during operations, a considerable amount of the solvent is in a gaseous condition and can be dissipated readily into the surrounding air.

Preventing Solvent Loss

There are several ways in which the loss of solvent from air motion can be minimized. First, the equipment should be located away from heating and ventilating units which might cause drafts, though if this is impractical, the direction of air flow to and from these units can be changed, or the degreasing equipment can be shielded to lessen the effects of the air currents. Shields should be placed on the windward side of the machine only, and should be about 36 inches high for maximum efficiency. Placing shields on the lee side of the equipment increases rather than decreases the relative solvent loss.

Another factor which contributes to excessive solvent loss is improper heat balance. Immediately above the liquid solvent is a zone, or layer, occupied by pure solvent vapors, and above them is a mixture of air-and-solvent vapors. Now, as the heat of the solvent is raised, it gives off additional vapors, pushing them out of the degreaser and into the surrounding atmosphere where they are dissipated. If there is constant fluctuation of the temperature within the machine, a continuous pumping action is set up and solvent vapors are forced into the air instead of condensing and dropping back into the solvent vat.

It is perfectly easy, of course, to maintain the heating element in the solvent tank at a constant temperature. Unfortunately, it does not follow that the temperature in the cleaning chamber above the solvent will remain equally constant. The temperature, and the mass, or volume, of the work entering the machine has an almost instantaneous effect upon the heat of the vapors. Large pieces, or pieces with a much lower temperature than that of the solvent vapors cause considerable drop in solvent-vapor zone, and the above mentioned pumping cycle is initiated.

Checking Vapor Drop

There is a relatively simple way of checking or measuring the vapor drop, and that is to suspend a strip of metal inside the cleaning chambers. The part of this strip which extends into the true vapor zone will be wet, while the part in the air-vapor zone will remain dry. Most solvent-vapor degreasing machines have a water jacket, or condenser built into their walls about halfway up, and this, along with the suspended metal strip, can serve as a guide in determining the correct solvent-vapor level, thus checking the heat balance.

Vapor level within the machine should be controlled by varying the heat input, rather than by changing the temperature of the water in the condenser. To ensure efficient condenser operation, the water temperature at the outlet should be checked regularly, while the work is being run through and set at the minimum poi of the proper range. In this way the maximum efficient temperature will not be exceeded when the degreaser is standing by. Depending upon the type of condenser, the temperature range will vary as follows:

1. Jacket condenser, from room temperature to 120° F.
2. Coil condenser, from 100° to 120° F.
3. Shell condenser located above the top of the jacket, from 120° to 140° F.
4. Shell condenser located at middle of jacket or lower, from room temperature to 100° F.

Degreasing By Spray

Many degreasing operations call for solvent spraying as well as immersion and solvent-vapor cleaning. In hand-operated degreasing the spraying is done with a movable spray nozzle that permits the operator to reach all parts of the work. If, however, he is to avoid excessive solvent loss through evaporation and operation he should be instructed to keep the spray nozzle within the true-vapor zone. As mentioned before, this can be easily determined by having a rod or strip of metal suspended in the degreaser. The wet area of this strip will indicate the height of the true-vapor zone. In automatic spray degreasers, the spray nozzles should be arranged so that the spray is directed within the vapor zone and heat input should be sufficient so that the vapor zone extends above the top bank of nozzles. To determine whether the degreaser is operating efficiently it is necessary only to compare the elevation of the wet line on the metal strip with that of the wet line on the condenser. The greater the disparity between the two, the greater the amount of air-mixed solvent, indicating excessive solvent loss and consequent reduction in efficiency.

Oven Cleaning

A variation of solvent degreasing often used for cleaning sheet stock is oven cleaning. The stock is sheared to size and run through a roller coating machine where both sides of the sheet are coated with a solvent. Generally, that solvent is of the petroleum hydrocarbon type with a boiling point of about 160° F. and an end point of from 380° to 382° F. After being coated with solvent, the sheets are put vertically into a conveyor and carried into a continuous tunnel oven. Peak oven temperature should be somewhere between 420° and 450° F. and the sheet should remain at the maximum temperature only about five minutes. The total time in the oven will vary from about 17 to 24 minutes, depending upon the type of oven used. The solvent with which the sheets have been coated, dilutes the grease and flows it out into a thin film which is readily burned off by the heat, leaving the metal dry and clean.

Non-solvent Cleaning

Within the past few years there has grown up a wider use of a non-solvent, or mechanical, metal cleaning operation. Employing grit or abrasive as the cleaning agent, this non-solvent cleaning is called air blasting, or airless blasting, depending upon the type of equipment used. Air blasting, as the name implies, is a cleaning operation in which the abrasive material is applied to the metal under air pressures ranging from 60 to 100 pounds per square inch.

Actually, the basic technique is not new. It dates back several years, but the equipment available today is so far improved over the original equipment that this process has taken on a newness that is rapidly bringing it to the forefront. The process is economical in its first cost as well as in its maintenance which has been considerably reduced by the introduction of new, hard alloy nozzles and new types of abrasives.

Although sand still is widely used, there is a growing trend toward the use of steel abrasives. Such abrasives have a number of advantages. Because they give off no dust, they are safer to use, reducing the hazard of silicosis and other respiratory ailments. They do not break down and wear away as does sand and can be cleaned and re-used many times. The metallic grits can be mixed in varying proportions to produce finishes ranging from fine to coarse and they accomplish the cleaning operation more quickly.

Along with these improvements in blasting nozzles and abrasives have come other advances in equipment. Spent abrasive is mechanically collected, cleaned, and returned to the blast unit, ready for further use. Depending upon the size and shape of the work to be cleaned, blast cleaning equipment may range in size from small cabinets to large, specially equipped rooms. In the cabinet units the blast nozzles generally are fixed and the work is shifted around so as to be cleaned on all surfaces. In the larger units, the operator works with a hose and nozzle which can be moved around so as to reach all surfaces of the part or assembly.

An illustration of cleaning aluminum alloy sheets by dipping.

In addition to the air blasting equipment, there now are several types of airless mechanical cleaners. Usually such units work on the centrifugal principle. The abrasive being thrown against the work by the high speed rotation of the equipment.

Cleaning Aluminum Surfaces

The cleaning of aluminum is generally considered as presenting rather unique problems especially when the metal has been stamped or forged. Because aluminum has a relatively soft and porous surface, forging, stamping, and rolling tend to work the soil, or foreign matter, into the pores from which it is difficult to remove thoroughly. Generally, wiping the surface with a solvent or degreasing compound is not

sufficiently thorough, and, often, solvent-vapor degreasing does not remove the inert particles, which, if left to remain, will reduce the firmness of the bond between the metal and the finish. Deep drawing with graphite compounds seldom provides the answer, for while the graphite is an excellent lubricant for removing other soil, it in itself, is extremely hard to remove and thus it merely substitutes one type of contamination for another.

Although there are times when one of the blasting methods may answer the problems of aluminum cleaning, perhaps the most satisfactory method is immersion cleaning despite the four steps required. The parts are first immersed in a "wetting" solution; that is, one prepared with a surface-tension depressor. Having a greater affinity for the metal than for the dirt or foreign matter, this solution works between the soil and the metal, thus reducing the adhesion. Rinsing with water under pressure removes some of the loosened soil and the parts then are put into a hot alkaline bath. In this bath the loose dirt and soil are floated off. Following this, the parts are thoroughly rinsed in hot water and then dried. If the surfaces require an etch, and all of them should if they are to be painted, this may be done by immersion in a phosphoric acid solution. This solution may be used either hot or cold. Hot phosphoric acid etches work much more quickly than do cold etches, and only a short time is required for a satisfactory etch in a hot solution. Aluminum parts which are to be anodized or chromodized do not receive an etch.

Aluminum in the form of heavy sheets, castings, extrusions and rolled shapes often can be satisfactorily cleaned by sand blasting, using much the same equipment as that required for cleaning other metals. Because of the danger of eroding, or wearing away the surface, only a mild sand blasting is recommended. For this purpose, a silica sand of from 40 to 80 mesh should be applied with an air pressure of 85 pounds per square inch through a ½ x 3-inch nozzle held about 12 inches from the work being cleaned. Blast cleaning generally is not recommended for light-gauge sheet because of the danger of warping the metal.

Cleaning Brass

Although the cleaning of brass sometimes proves troublesome, it can generally be handled satisfactorily by using the following procedure. First comes a thorough degreasing in a hot alkaline bath having a pH of somewhere about 12. This will probably discolor the metal, but the discoloration is not permanent and will disappear during subsequent treatments. The next step is a thorough rinse in water, following which the pieces should be put into a well-inhibited pickling solution. The pickle bath should be anywhere from a few seconds to a few minutes in duration. The parts are again rinsed and then given a few seconds in a bright dip, following which they are rinsed and dried. If they are not to be painted, the pieces can be kept bright for a time by a coating of clear lacquer. The pickle bath which has been mentioned here, often is eliminated by some practical finishers, but because the bright dip loses its efficiency rather quickly even under normal conditions, many others have found it to be more economical to use the pickle. A great part of the oxidation products on the metal are thrown off in the pickle and consequently, the bright dip becomes less contaminated, maintaining its strength over longer periods.

Cleaning Zinc Surfaces

Zinc-coated surfaces, either galvanized or plated, are particularly difficult to finish satisfactorily because they are somewhat greasy and prevent paint from forming a firm bond, unless they first are specially cleaned. The cleaning itself, also may present some difficulties, for if the solutions are too highly alkaline or acid they will strip the zinc from the metal. Such surfaces, however, can be prepared for painting if reasonable care is exerted. The first step is a thorough degreasing in a mildly alkaline solution, followed by a rinsing in clean water, either hot or cold. After this, a mildly acid solution of the phosphoric acid type is applied and allowed to remain as long as five minutes to provide a slight etch. No neutralizing bath is required, and after the surface has once more been thoroughly rinsed in cold water and dried, it is ready for painting. This cleaning method has the advantage of being adaptable for use on sheets or structural forms too large for immersion. The alkaline degreasing solution and the acid etch can be sprayed on such pieces and rinsed off with water under pressure.

• • •

New Distillate Fuel Supply

Plans have been announced to tap the vast natural gas reserves of southwest Kansas as a source of high grade gasoline and distillate fuel. This gas is of too low a heat content to be used for direct gas supply, but by processing about 100 million feet of the gas per day a yield of 6,000 barrels of gasoline and 1,000 barrels of distillate can be obtained daily. Recovery will be by synthetic means based upon German principles.

Foremen Union Ruling

In its first unanimous decision on the foreman's issue, the National Labor Relations Board recently ruled that the National Foreman's Association of America was the proper bargaining group in a Detroit branch of a Chicago manufacturer. In a separate concurring opinion one member said—"No foreman can be an effective agent of management when called upon to supervise workers who are also his union brothers, all bound by the same set of rules."

Portal-to-Portal Pay

Portal-to-portal pay suits are getting the big headlines, but employers ought to understand that many of the suits are hastily drawn and presented more in hope than in firm belief. The pottery decision on which this whole muddle is based did grant some back pay, but denied many of the claims which are now included in the latest suits.

Only the minimum time required to get from clock to bench was granted; the court excluded insignificant time periods; only such preliminary work as contributed to productive work was allowed.

In the light of these rulings such time as parking cars, running personal errands, changing clothes, washing up—where for the convenience of the workman will not be allowed. Further, previous accepted methods of starting the day, etc., will undoubtedly be considered before courts rule in favor of back pay for time previously given by the workman.

Welding Output Doubled—

By Atomic Hydrogen Process

By William P. Brotherton

Ryan Aeronautical Company, San Diego, California

Little used before the frenzied production of wartime, atomic hydrogen welding has developed into a valuable method of joining metals. It is finding a wide variety of application in the fabrication of parts made of cast and wrought aluminum and its alloys, low and high carbon tool steels and stainless steels of the 18-8 type. Aircraft exhaust systems, electronic tubes, radio and switchgear cases, large diameter metal tubing, high speed cutting tools, turbosuperchargers, gas turbines and jet engines are a few of the products which are manufactured with the use of this welding method.

Atomic hydrogen welding depends for fusion upon the heat of an electric arc plus the heat released by hydrogen gas after passing through the arc. The welding torch, which the operator can carry in one hand, consists of an electrode holder mounting two tungsten electrodes. These tungsten wires are set in a "V" at an angle of approximately 50°. They may be obtained in various diameters depending upon the gauge of the metal to be welded. Surrounding each electrode is a hollow perforated sleeve through which pure hydrogen gas is forced under low pressure—usually between one and five pounds. The holder is connected by a hose to a supply of hydrogen and by conductor wires to an alternating current welding unit.

How Energy Is Released

To start welding, the bottom ends of the electrodes are pulled apart to produce an arc. The stream of hydrogen surrounds this arc and much of the hydrogen undergoes a change. Briefly, the hydrogen particles are broken up from molecules into atoms. This change causes the hydrogen to absorb heat. As the hydrogen passes out of the arc, it returns to its original molecular structure and releases the heat previously absorbed. This heat, plus that from the arc stream itself, results in a higher temperature than that obtained if the arc or hydrogen gas alone were used for welding. The arc circuit is from one electrode to the other and back to the welding machine unit so that no ground connection is required. This gives the operator greater freedom to move about. The tungsten electrodes are slowly consumed from the intense heat and require adjustment from time to time.

When the arc is struck between the electrodes, it is bathed in an atmosphere of burning hydrogen which burns with a yellowish flame. The arc itself can be identified because of its brilliant blue-white color. The hottest point, the edge of the arc stream, should be brought into contact with the work. When this is done an envelope, or shield, of protective hydrogen gas is placed over the point of fusion. This hot hydrogen gas reduces any oxides that may be present as foreign material and protects the electrodes from undue oxidation. It also eliminates the use of flux on the upperside of an atomic hydrogen weld. The need for insuring similar protection on the underside, however, should not be overlooked.

The greater heat realized from the atomic hydrogen process, from 6000° to 7000° C., permits faster travel than with most

other welding methods. This intense heat necessitates close attention to cooling devices and adequate welding jigs to preserve alignment and prevent warping due to expansion.

Carbon Must Be Added

The atomic hydrogen method cannot add carbon to the weld. In fact it usually causes a slight loss in carbon. Since hydrogen is, in many respects, the opposite of oxygen, a reducing atmosphere is present during welding to prevent the occurrence of "burning" or severe oxidation. The process is widely employed on light gauge work. Since the torch is carried in one hand, a filler rod can be readily used if additional weld metal is required. These rods should be practically the same analysis as that of the work, except for carbon content. In cases where carbon is a vital constituent of the welded metal, extra amounts should be contained in the filler rod metal to compensate for its loss.

Although known to possess definite advantages over other methods, atomic hydrogen got a late start because early attempts to use it met with many stumbling blocks. The high heat of the process made it difficult for the welder to control his speed. Too slow a speed would often result in burning through, with consequent repairs to and sometimes scrapping of, the part. Too fast a speed produced severe shrinking of the weld over its length so that a series of cracks would form. These cracks necessitated repair welding and caused an unfavorable attitude upon the part of the worker and supervisor.

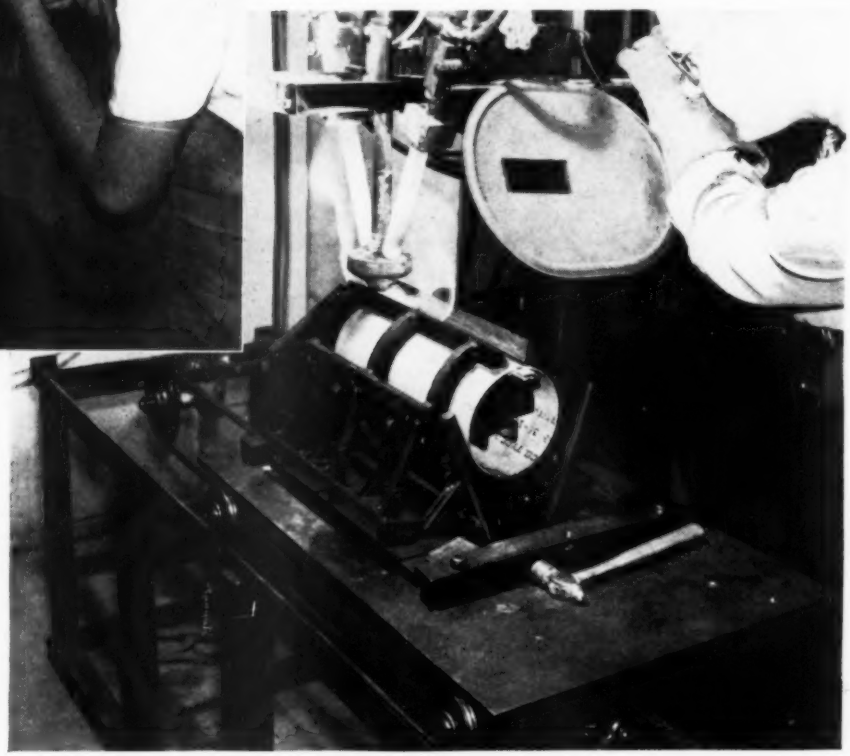
Careful evaluation of experience soon brought forth much interesting and valuable information. The "silent arc," obtained when the electrodes are held closely together, permitted a finer control on thin gauges of metal. The "singing arc," developed by separating the electrodes to a greater extent, often forced the welder to work so rapidly that cracks would develop because of the severe cooling which followed as the arc passed over the molten metal.

The formation of "worm holes" almost in the center of the weld and running lengthwise with the bead puzzled the technician. They were caused by too rapid welding in which the metal was not given time to flow flat before it became frozen. Although present methods for using the atomic hydrogen process call for a welding speed that is somewhat slower than early rates, they are more than twice as fast as the oxy-acetylene method. The use of the "silent arc" has become standard in the industry because of the fine control which it gives.

The Ryan Aeronautical Company was one of the first aircraft concerns to adapt the atomic hydrogen process to its needs. Just before the war, Ryan welding supervisors designed special light-weight torches, for use by women, which became models for the subsequent convenient holders now in use. In the building of aircraft exhaust systems, one of the important products of the Ryan Aeronautical Company, atomic hydrogen has proved to be extremely beneficial.

Advantages of Process

Exhaust manifolds for huge aircraft engines are made of thin-gauge stainless steel. This metal must retain its corrosion resistance at the elevated temperatures of 1600° F., which are encountered in flight service. Corrosion resistance of stainless steel (18-8) depends upon the minimum amount of carbon being present and the vital inclusion of stabilizing agents such



Above—Atomic Hydrogen process welds a thin gauge steel structure with a minimum of distortion.

Right—A welding conveyor designed by the Ryan Company that automatically welds parts at speeds up to 28 inches per minute.

as titanium or columbium in the formula. Several disadvantages accrued from the use of oxy-acetylene gas welding in the manufacture of this equipment. At times both ductility and corrosion resistance were lowered. If an excessive amount of acetylene were used, carbon would be picked up by the steel and ductility reduced. An excessive heating of the metal caused a partial loss of the stabilizing elements and consequent lowering of corrosion resistance.

Atomic hydrogen welding adds no carbon to the weld and, therefore, there is none to pick up. In addition, the higher temperatures of the atomic arc shorten the heating time to insure better maintenance of the corrosion resistance of the stainless steel.

"Atomic" Applications

Atomic hydrogen is used quite successfully at Ryan for "tacking" operations. Here higher hydrogen pressures and current values are maintained to obtain the high heat required to bring the metal temperature up quickly and develop a small "tack" weld without distorting the assembly. This method is used to "stitch" assemblies together in perfect alignment for further fabrication. Ill-fitting parts may be welded with atomic hydrogen because of its flexibility which permits the arc fan to be rotated to almost any desired angle.

At Ryan, we have welded lap, fillet, butt, flange, seam and edge and corner joints with this method. The process has proved to be adequate to a wide range of joints and to produce sound, fatigue-resistant bonds which are the primary function of a welded joint.

Strong carrying cases for radio equipment and enclosures for switchgear have been made of wrought aluminum and welded in record time with atomic hydrogen. The good physical properties of the weld bead; soundness, high density and a decided smoothness, give these atomic hydrogen welded structures an exceptional appearance.

The process has played a major role in maintaining production schedules on aluminum castings by its excellent facility for making repair welds of all sizes. The physical properties of the deposited weld metal are generally superior to material of the same composition in the "as cast" condition. This is due largely to the absence of microshrinkage and the fine grain size produced by rapid solidification of the weld metal.

An interesting application of atomic hydrogen welding is in the fabrication of electronic tubes. Here the requirements call for good appearance and permanent tightness of welded joints in vacuum-tight tubes. Dissimilar metals such as iron, nickel, cobalt alloy and plain carbon steel, are readily welded together in different thicknesses to form sound air-tight joints in these units.

Excellent results have been obtained and a great deal of time and money saved by the use of atomic hydrogen to weld broken surfaces of tools and dies. In this field and in the manufacture of new tools, high carbon steel is deposited on mild steel by the process. A smooth finish is obtained and a minimum amount of surplus metal need be added for subsequent removal by grinding.

Unusual technique for welding long enclosed sections—illuminating gas is burned within the structure to prevent oxidation of the inside weld seam. The outside seam is protected by the envelope of hydrogen gas.

In the production of dies and molds for the plastics manufacturing industry, composited dies may be fabricated by the atomic welding process. This method offers a saving in cost when large quantities of material are involved because it permits the use of low alloy steel for the major part of the die with the cutting or working surfaces only of tool steel. In most cases, it is desirable to preheat the hardened tool or die in order to minimize the danger of cracking as a result of thermal stresses caused by localized welding heat.

Weld Output Raised

At the Ryan Aeronautical Company the use of atomic hydrogen has increased welding output because of the greater speed attained and simplified visual inspection due to the narrower weld bead which it produces. Because of the higher production, the cost of atomic hydrogen welding is less than that of the oxy-acetylene method. About one-third of a cylin-

der of hydrogen per operator is used daily with an electrode cost of approximately twenty cents. It is estimated that an atomic hydrogen weld seam runs five cents a foot compared to eleven cents for oxy-acetylene gas.

The pressure gauges used are standard welding types with the exception that the working pressure gauge is graduated in one-pound divisions.

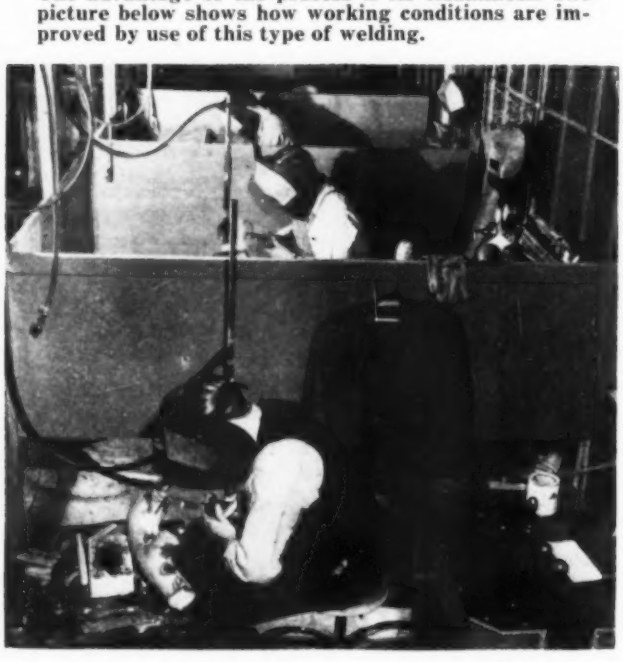
During the war, Ryan trained a great many women in the use of the atomic method and designed a light-weight torch to overcome the physical fatigue which accompanied use of early heavy holders. These feminine welders worked full eight hour shifts and six day weeks to speed production. Our supervisors found that it required only one week to train them to use the process well enough to meet the certification tests. After that the women received additional instruction while on the production line.

In order to get the utmost in welding speeds, Ryan engineers designed and built automatic atomic hydrogen welding machines which produce smooth uniform welds at the rate of 28 inches per minute. This compares with the oxy-acetylene rate of five inches and the ten to twelve inches per minute of the metallic arc process.

Disadvantages of Process

In general, the same welding defects which are experienced in faulty oxy-acetylene gas welding must be guarded against in atomic hydrogen, and for the same reasons. Since the rate is faster, faulty technique and errors show up more quickly. The four key conditions of a weld are (1) uniformity of height, (2) uniformity of width, (3) proper speed and (4) correct amounts of filler rod metal. Atomic hydrogen welding defects may be classified into 11 general groups:

One advantage of the process is its cleanliness. The picture below shows how working conditions are improved by use of this type of welding.



(1) *Excessive penetration* is usually caused by too high a flange or addition of filler rod to flange of proper height. Excessive heat input requiring filler rod to bring weld height to proper level also contributes to this defect. Too slow welding speed, excessive weld width and striving to produce a "flat" bead on the weld surface are also causes.

(2) *Insufficient penetration,* characterized by little or no reinforcing bead on the underside of the weld, is usually caused by low heat input, too great weld height, too fast weld speed, torch at too low an angle or improper weld motion and dirty, scaly metal.

(3) *Undercuts* are caused by too high heat input, too slow welding speed, insufficient flange or filler rod, too wide weld, and poor welding technique. This defect parallels excessive penetration since they are caused by the same conditions.

(4) *Porosity* makes a weld weak and brittle. Some 18-8 steels, particularly those stabilized by titanium, are susceptible. Slower rate of travel is advantageous in overcoming this defect. Excessive puddling induces porosity. Mild steels are usually free from this disadvantage.

(5) *Cracks* may be caused by stresses set up by welding or by cold work and forming after welding. Parts held rigid by jigs and fixtures are more likely to crack upon cooling. Post-heating in the area surrounding tack welds prevents cracking. Insistence that parts be correctly fitted before welding will reduce the amount of cold working required, thus decreasing the number of cracks formed.

(6) *Inclusions* are not common in atomic hydrogen welding. Dirty, scaly parts and the presence of oxidized material on the filler rod produce this effect.

(7) *Excessive weld width* results only from poor welding technique and poorly fitted parts.

(8) *Inconsistency,* a defect characterized by a varied height and width of weld, usually results from poorly fitted parts, incorrect rate of welding, unevenly trimmed flanges, improperly positioned parts, part contour not properly aligned and poorly tacked parts.

(9) *Poor starts and endings* are often accompanied by the burning away of parent weld metal at the start and are usually the result of inexperience or use of incorrect weld procedure.

(10) *"Mushroom" penetration,* where weld metal fails to bond at the edge, is not common because its usual cause is an unsuitable welding flux.

(11) *"Worm holing,"* identified by the appearance of

(Continued on Page 266)

The ABC's of Metal Properties*

METALS can be stretched, pulled apart, bent, twisted, broken off, compressed, dented, or scratched. Some pieces of metal cannot be pulled apart by a team of horses, while others of the same size can be bent by a child. Some metals can be scratched by the fingernail while others will withstand hours of pounding against solid rock. With such widely varying properties, therefore, it becomes a problem to express the properties of metals in concise terms so that a few words will tell one exactly what type of service a piece of metal will withstand without failure.

The answer to this problem has been provided by the development of certain tests by means of which the properties of materials can be accurately determined in terms of such fundamental units as pounds and inches. Then, by a common understanding of the tests performed and the properties determined, the results can be fully understood by everyone.

Tensile Strength

Tensile strength is undoubtedly the most widely familiar of the terms to be discussed. The measure of this strength is the amount of smoothly applied, direct pull that a part will stand before it breaks. For instance, the strength of a wire could be measured by fastening one end rigidly and attaching a pan to the other end. If the pan were then loaded with shot until the wire broke, and the weight of the pan and shot determined, the strength of the wire would be found to be a certain number of pounds.

Such a test would not determine the strength of the material of which the wire was made, however, unless the cross section of the wire was taken into consideration in expressing the result. For instance, if the weight required to break the wire was 50 lb., and the wire were made of steel, it could not be said that the tensile strength of the particular *steel* was 50 lb. The thickness of the wire would also be a necessary part of the answer.

Of course, the method just given would be cumbersome for measuring the strength of, for instance, a 2-in. bar. For that reason, tension tests are usually made in standard machines which can apply a smooth pull of sufficient power. A jerky pull would give misleading results.

For convenience, the tensile strength of metals is given for a unit cross section, or, in other words, as the strength of a square bar, 1 in. wide, 1 in. thick, and of any convenient length. The length of the bar does not affect the results. The actual test specimens seldom have those dimensions, however. The most frequently used standard specimen is a round bar having a diameter of 0.505 in. over a distance of at least 2 inches. The results of the test are then converted by simple arithmetic to the unit cross section.

In testing welds or plate material, the test specimen may have any convenient dimensions, perhaps 8 in. by 1¼ in. by ¼ inch. Let us suppose that a specimen of that size was tested in a tensile-strength testing machine as shown above, and that it took a pull of 18,000 lb. to break the bar. What would the tensile strength of the material be?

The cross section of the bar is

$$1\tfrac{1}{4} \text{ in.} \times \tfrac{1}{4} \text{ in.} = 5/16 \text{ sq. in.}$$

If 18,000 lb. is the strength of 5/16 sq. in., the strength of 1 sq. in., or the tensile strength of the material, is

$$\begin{aligned} 18{,}000 \div 5/16 &= 18{,}000 \times 16/5 \\ &= 57{,}600 \text{ lb. per sq. in.} \\ &= 58{,}000 \text{ lb. per sq. in.} \\ &\quad \text{(in round numbers)} \end{aligned}$$

Often the strength of a material is known for the standard specimens, but it is desired to know the strength of a piece of some other size. For instance, suppose that the tensile strength of a material was known to be 60,000 lb. per sq. in. and that it was desired to know the strength of a round bar 2 in. in diameter.

The cross-sectional area of the bar is a circle 2 in. in diameter. To find the area of this circle, the diameter is multiplied by itself and then multiplied by a constant, 0.785.

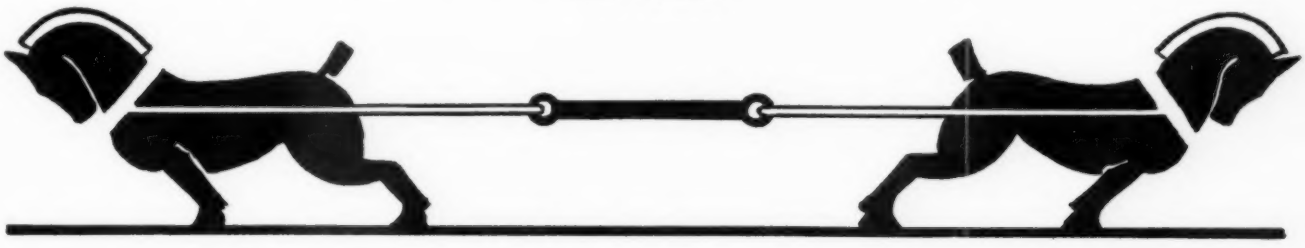
Therefore,

$$\begin{aligned} \text{Cross section} &= 2 \times 2 \times 0.785 \\ &= 3.14 \text{ sq. in.} \end{aligned}$$

Since 1 sq. in. has a strength of 60,000 lb., the strength of

**Reprinted from Linde Co's. "Oxy-acetylene Tips"*

Tensile strength is the amount of directly applied pull a part will stand before it breaks. It is expressed as the number of pounds of force required to break a bar 1 in. wide and 1 in. thick.



this 2-in round bar is 3.14 times 60,000 lb., or

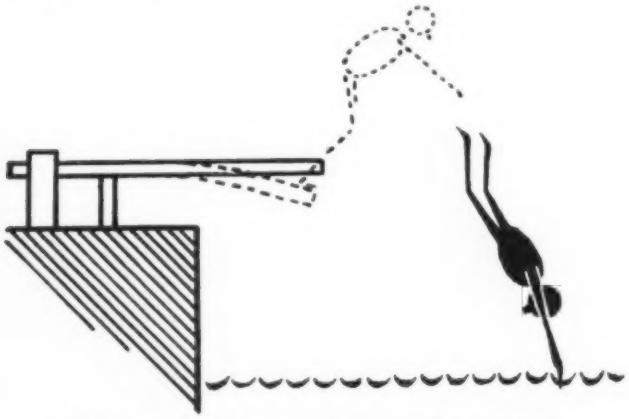
$$\text{Strength} = 3.14 \times 60{,}000 = 188{,}400 \text{ lb.}$$

Elasticity

Most metals do not break off all at once. As the load is gradually applied in a tension-test machine, for instance, the specimen will be seen to stretch for some time. Then a noticeable "necking-in" will occur at some point, and later, as the load increases, the part will break. The stretch which is observed in such a test is not the same type of action all the way. At first it is an elastic stretch and then later a permanent stretch.

If you were to take a piece of rubber and stretch it, it would return to its original size just about as soon as you let go. If you pulled it harder, it would snap off. No matter how hard you pulled it, or twisted it, or squeezed it, however, as long as you did not break it, it would go back to its original size when the force was removed.

Now up to a certain point, metals act in that same way. They are elastic. They stretch or bend or twist under force, and then return to their original size when the force is removed, in just the same way, but not to as great an extent, as the piece or rubber.



An elastic substance returns to its original shape after the load has been removed. When the part does not return to its original shape after the load is removed, the elastic limit has been exceeded.

When the rubber reaches the end of its elasticity, it breaks. Most metals, however, do not break when they reach the elastic limit, but keep on stretching for some time before they break. Beyond the elastic limit, therefore, metals act more like molasses candy—they change shape with the force, but when the force is removed, they do not return to the original shape but are permanently deformed.

In short, then, when a metal part is acted upon by a force — pulled, twisted, bent, or squeezed (compressed) — it changes shape elastically for a while or until the force reaches the elastic limit, then it permanently deforms. The elastic limit is therefore the point at which permanent deformation begins. In industrial applications this point is approximately determined and expressed as the yield point or the yield strength of the metal.

Yield Point

In soft steel a rather curious change takes place during a tension test. As the load on a test specimen is increased slowly, a point is found at which a definite increase in length of the specimen occurs with no increase in load. The load at this point, expressed as pounds per square inch, is called the yield point of the material.

Yield Strength

In some steels and in non-ferrous metals the elastic limit is not so easily determined. When the load in tests on such metals is sufficient to cause a *permanent* elongation of a certain small amount, the "pounds per square inch" required to produce that deformation is called the yield strength of the material.

Ductility

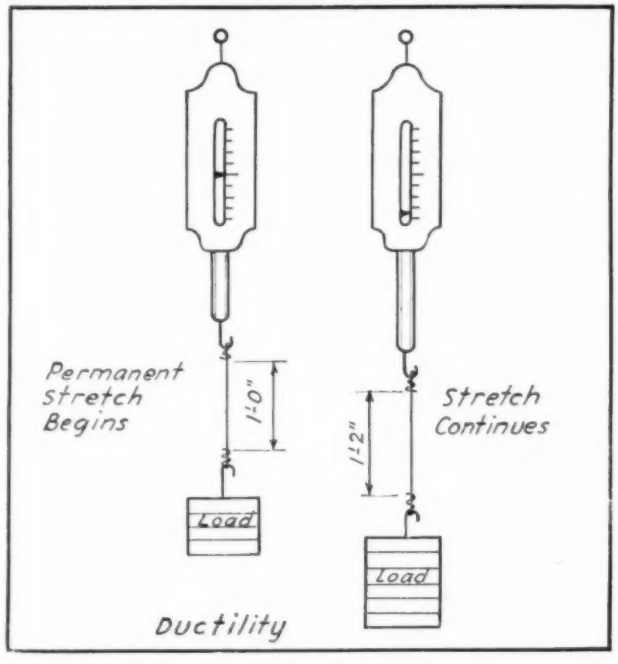
Ductility is a term which is frequently misused. A ductile material is one that can be *permanently* deformed without failure. Because a metal bends easily, it is not necessarily ductile, unless such bending is a permanent deformation. For instance, a spring may be flexible and bend easily and yet it may withstand but little permanent deformation, or set, without breaking. Such a spring would have low ductility.

As pointed out previously, rubber is elastic but molasses candy or chewing gum is ductile. All metals are both elastic and ductile to some extent, although of course some metals are more elastic than others, and some are more ductile.

There are two common methods of measuring ductility. One is a method whereby the ductility may be stated as the amount of *permanent* stretch a part will undergo in a tension test. The other method employs a free-bend test for a comparable determination.

In the first method a distance, usually 2 in., is measured off at the center of a standard tension-test specimen. The ends of this distance are prick-punched. The specimen is then pulled until failure occurs. After the broken parts have been matched together, the distance between the prick-punch marks is measured again. Suppose this new distance is 2.3 inches. The increase in length, or elongation, is therefore 2.3 in. minus 2 in. or 0.3 inch. Dividing 0.3 by 2 gives 0.15 or 15 per cent. Therefore, the ductility of the specimen is said to be 15 per cent elongation in 2 inches. That is the

A ductile substance withstands increased load beyond the elastic limit. The farther it stretches after the elastic limit has been passed the more ductile it is.



standard method for determining one measure or expression of ductility.

The second method is frequently used to determine the ductility of a completed weld. Essentially the same procedure is followed, except that the stretch is produced by bending the specimen. First, a specimen is cut out across the weld. Then the top of the weld is ground flush with the base-metal surface, with the scratches produced by the grinding running across the weld in the direction of the bend or stretch. Scratches across the length of the weld might give incorrect results by causing premature failure. Next, a distance is measured across the weld and its ends located by prick-punch marks. This entire distance should be contained in the weld.

The specimen is then bent by a steady force, having the surface containing the prick-punch marks at the outside of the bend. As soon as any crack in the weld surface can be observed, bending is stopped and the new distance between the prick-punch marks measured with a flexible ruler. From this and the original distance, the elongation is calculated the same as before and is another measure of ductility.

Brittleness

Some metals show practically no permanent distortion before failure. In other words, they fail suddenly without any warning. Such materials are said to be brittle. Brittleness, therefore, indicates a lack of ductility.

Malleability is defined as "that property of a material by virtue of which it can be rolled or hammered into thinner sheets."

A piece of dry wood is an example of material that is brittle. It is elastic because it will bend and return to its original shape. But if it is bent a little farther, it snaps off. An example of a familiar metal which is brittle is ordinary white cast iron.

Toughness

Toughness is probably the most loosely used of all terms referring to metal properties. It is a descriptive word without any exact dimensions. It has frequently been defined as the resistance of a metal to start of permanent deformation plus the resistance the metal has to failure after permanent deformation has begun. By this definition then, molasses candy is not extremely tough, as it starts to stretch so easily.

In the discussion of ductility, no mention was made of the force required to produce failure. As usually employed, toughness would indicate that a considerable force would be required to cause failure in a test for measuring ductility, even though the ductility itself might be low. In short, then, a tough material is one that can withstand considerable stress, slowly or suddenly applied, continuously or often applied, and which will deform before failure.

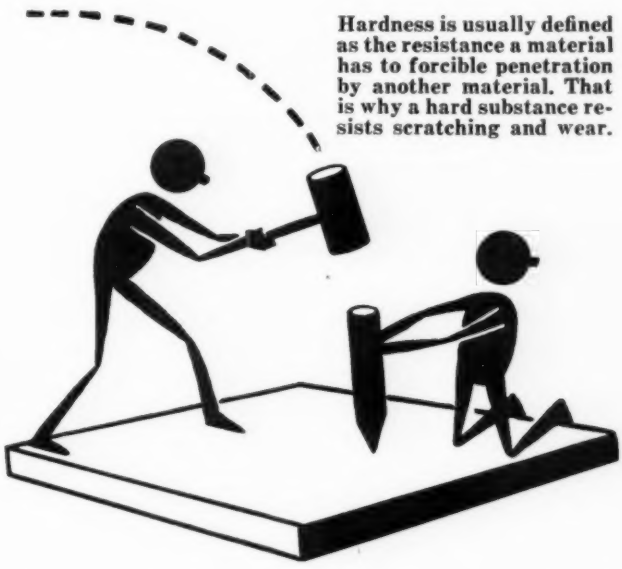
Hardness

Hardness is another rather loosely applied term but it usually denotes the resistance a substance has to the forceable penetration of another material. The use of the word hardness carries with it the idea of solidity and firmness.

A number of methods have been evolved for measuring hardness. Each has its particular features and all are frequently used.

Brinell Hardness Test. In this test a hardened steel ball is pressed against the surface of the material to be tested for a specified length of time by a definite known force. The diameter of the dent in the surface is then measured and the Brinell hardness number (sometimes abbreviated as Bhn) is determined from standard tables.

Rockwell Hardness Test. In this test the difference in depth of penetration obtained under a small and large load is determined. The letter designations on the Rockwell scale, such as "B," and "C," indicate the type of penetrator used and the major load. Rockwell hardness-testing machines are built so that the hardness number may be read direct from the dial of the machine.



Hardness is usually defined as the resistance a material has to forcible penetration by another material. That is why a hard substance resists scratching and wear.

Sclerescope Hardness Test. In this test a diamond-point hammer is dropped upon the surface to be tested and the height of rebound measured. The higher the rebound, the higher the hardness.

Monotron Hardness Test. This machine measures directly the load that is required to produce a definite penetration.

Vickers Hardness Test. This test is similar to the Brinell test, except that a diamond pyramid is used instead of a hard steel ball. The Vickers hardness number is determined by the ratio of the load to the area of the indentation produced.

Conversion of Test Results. Since each hardness test differs considerably from most of the others, the results in one type of test cannot be accurately converted to another. For practical purposes, however, a conversion table is satisfactory.

Moh's Scale of hardness. Occasionally in articles referring to hard-facing materials, Moh's scale of hardness is mentioned. This is an arbitrary scale usually used by mineralogists. Numbers from 1 to 10 have been assigned to certain specific substances. An unknown hardness is determined by comparison with a standard substance. For instance, if a material cannot

be scratched by one substance but can be scratched by the material which is next higher on Moh's scale, the unknown hardness is designated as between the two substances used. The standard substances and their respective numbers are:

Talc—1	Feldspar—6
Gypsum—2	Quartz—7
Talc Spar—3	Topaz—8
Fluor Spar—4	Sapphire—9
Apatite—5	Diamond—10

Thus a material which cannot be scratched by a sapphire but can be by a diamond is said to be between 9 and 10 on Moh's scale.

Relationship of Mechanical Properties

There is a close relationship between the properties of any one metal, so that if changes are caused in one property, changes also occur in the others. Thus if some treatment is given to a piece of steel so that its hardness is increased, the tensile strength will be increased also, and the ductility will be reduced. Similarly, as a metal is heated, it becomes soft and its ductility consequently increases while its tensile strength is lowered.

The closeness of the relationship between the properties makes it possible to estimate closely the tensile strength of ordinary carbon steel if the Brinell hardness number is known, or conversely, the Brinell hardness number can be estimated from the tensile strength. The following formula is used for these conversions.

$$\text{Tensile Strength} = \text{Brinell Hardness number} \times 500 \text{ (approximate)}$$

or

$$\text{Brinell hardness number} = \frac{\text{Tensile Strength}}{500}$$

For example, if the Brinell hardness number of a steel bar was known to be about 350:

$$\text{Tensile Strength} = 350 \times 500 = 175{,}000 \text{ lb. per sq. in.}$$

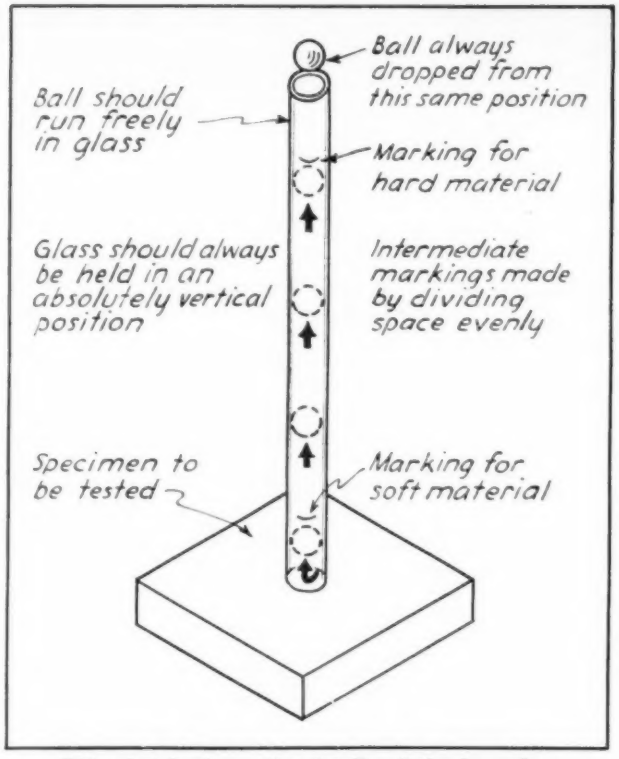
If the bar had a diameter of ½ in., the strength of the bar would be determined as follows:

$$\text{Cross Section} = \tfrac{1}{2} \times \tfrac{1}{2} \times 0.785 = 0.197 \text{ sq. in.}$$

$$\text{Tensile Strength} = 0.197 \times 175{,}000 = 34{,}000 \text{ lb.}$$

This table gives a quick means for determining approximate Brinell hardness by filing the surface of the metal with a new machinist's hand file.

Brinell Hardness	*Ease With Which Steel Surface Can Be Filed*
100	File bites into surface very easily. Metal is very soft.
200	File readily removes metal with slightly more pressure. Metal is still quite soft.
300	At 300 Brinell, the metal exhibits its first real resistance to the file.
400	File removes metal with difficulty. Metal is quite hard.
500	File just barely removes metal. Metal is only slightly softer than file.
600	File slides over surface without removing metal. File teeth are dulled.


Ball always dropped from this same position
Ball should run freely in glass
Marking for hard material
Glass should always be held in an absolutely vertical position
Intermediate markings made by dividing space evenly
Specimen to be tested
Marking for soft material

This sketch shows the details of the bouncing ball test. The low and high points can be determined by measuring the bounce on materials already measured by the file test or by standard machines.

The relationship for certain medium values of the tensile strength is quite close, while for the extreme high and low values, the conversion is not at all accurate. The Brinell hardness number used for calculating the strength of a part must be uniform throughout the thickness of the part.

Shop Methods for Measuring Properties

Most shops do not have equipment to measure any of the properties, except ductility by means of the bend test. Therefore, it should also be helpful to conclude this article with a description of two useful shop methods for measuring hardness, so that this property and tensile strength can be estimated.

File Hardness Test

By means of this test, a rough estimate of the Brinell hardness number can be found. A machinist's hand file, which should be new, is used to determine the resistance of the material to the cutting action of the file and from this an estimate of the Brinell hardness can be made. The table on this page explains this method.

Bouncing Ball Test

A method which any shop can use and which can be developed into a rather accurate test uses a steel ball bearing which is bounced upon a metal surface and the height of bounce measured. A steel ball bearing is made with great accuracy as to hardness and thus gives a cheap tool which will give accurate results.

A glass tube, such as a steam boiler glass, is used to guide the fall and bounce of the steel ball.

The test can be made quite accurate if the glass tube is calibrated after comparative tests with known specimens. This would be done by measuring the height of bounce of the ball when dropped on specimens of known hardness. These heights would then be marked on the glass, at least one quite low and one quite high. The space between these marks would then be divided evenly and marked.

Getting the Most Out of Your Press Brake

1001 Standard and Special Bending, Forming, Flanging, Punching Operations Your Press Brake Can Perform

By Ernest E. Zideck
Sheet Metal Consulting Engineer

Use of "Kirksite" in Dies

IN a preceding text we mentioned "Kirksite" in connection with shop-made plate dies, employable in the press brake, for punching holes, doing notchouts, and shearing long strips of metal on curved lines. The steel plate dies, often only 5/32" in thickness, serve well in that connection, and the only difficulty in making the dies perform, as needed for various work, is that the steel must be hardened by a torch flame, previously described. On the other hand the Kirksite metal is an alloy of exceptional hardness, needing no treating as the steel does, and therefore the plate-dies made of this metal are easier to make in a shop having no heat-treating facilities, or men experienced in doing the work swiftly and satisfactorily. Inexperienced men might burn the cutting edge of the steel plate, in which case the whole plate would have to be duplicated, as would happen if the bandsawing, or the hole placement, were inaccurately done. Another advantage of the Kirksite alloy is that inaccuracies in the line of sawing or in centering a hole can be remedied by welding. The alloy welds easily, does not become brittle under the flame, and the welding to it of a strip of the same metal to

Fig. 1 Kirksite Plates Employed for Female Dies

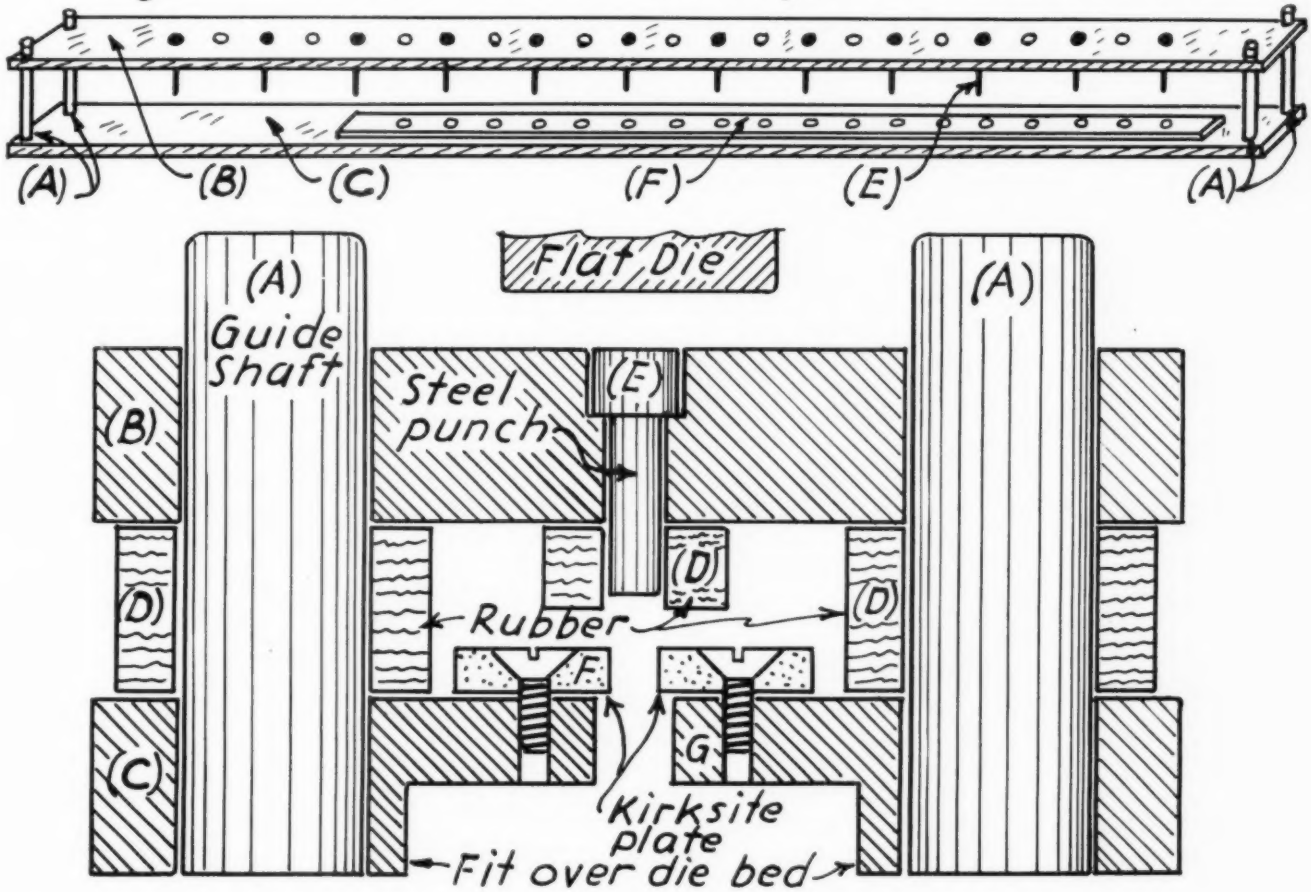


Fig. 2 Single Row Die - Strip

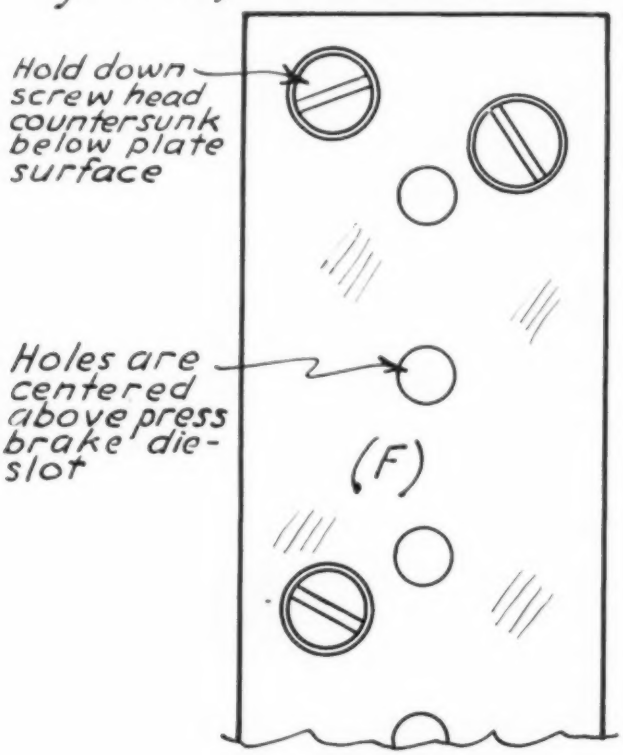


Fig. 3 Shifting Die - Plate - for desired row of holes to center above die - slot.

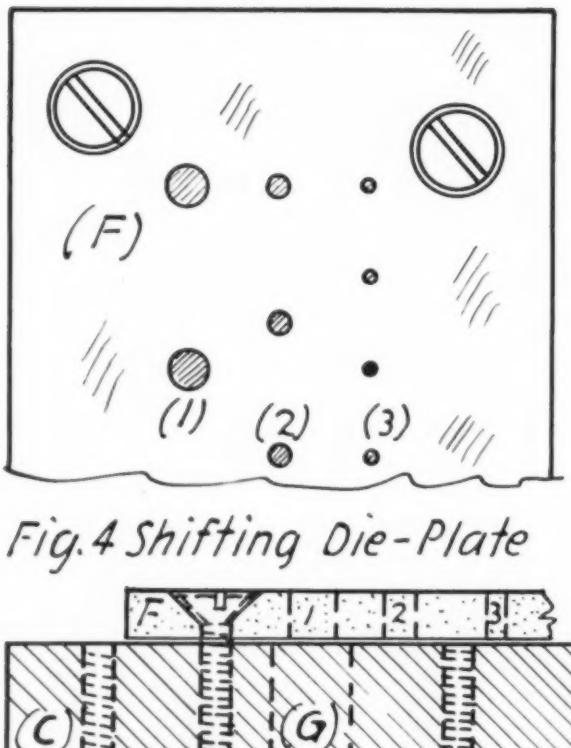
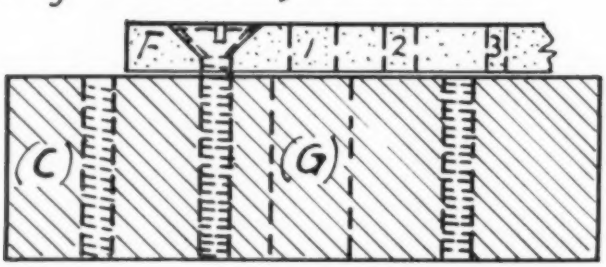


Fig. 4 Shifting Die - Plate



flame, and the welding to it of a strip of the same metal to provide for a new cut, or for misplaced holes, will not affect the cutting properties of the plate-edges in any way.

Uses of "Kirksite"

In the illustration, Fig. 1, is shown a fixture as used sheet metal parts for aircraft, although the use was principally cast dies operated in drop hammers and in some cases in the hydro-press. Meanwhile the manufacturers have started rolling the metal into plates, to be employed for dies with steel punches, for multiple hole punching of rivet holes, lightening holes and such uses, in aircraft parts. Stainless steel was punched, notched and sheared as well as was duro-aluminum, and gauges of the metals up to .050 were successfully processed.

In the illustration below, Fig. 1, is shown a fixture as used in one of the aircraft plants, the fixture built for operation on a press brake. As will be noticed at (A), heavy guide shafts are employed to hold the steel plates (B) and (C) in accurate alignment, so that the steel punches (E), tightly reposing in (B), are guided into the holes in plate (F), which is a Kirksite plate of ¼" thickness. In the upper steel plate (B) is shown a row of holes receiving punches (E), and there can be additional rows of these holes, or the holes can be placed ⅜" apart, although such holes are punched in the particular part only as needed, the punches being interchangeable and inserted into the holes as the work requires, as is indicated in the drawing's upper view. It will be seen in the drawing that there is no connection between the press brake ram and the plate (B), and that the ram moves freely upward, with a flat die mounted in it covering the punches and moving the plate (B) upon contacting same. If there are punches located in (B) which the flat die would not cover, a steel plate of about ½" thickness may be laid over the punches. If the fixture is of a length exceeding five feet, the plate (B) is reinforced by angles, so that the plate does not bend in the middle, causing a binding at the shafts (A). Strips of rubber (D) are employed laterally from the row of punches (E), for hold-down of the metal being punched. Similar rubber (D) pieces, which may be rings, are placed around the shafts (A), between the plates (B) and (C), to move the plate (B) upward after the punches (E) have descended deep enough into the holes in plate (F). The fixture is built to fit over the die-bed, as shown, so as to permit the slot (G) receiving the slugs. As to the Kirksite plate (F), it can be of any suitable width and contain any amount of holes corresponding to the punches in plate (B), or several individual strips of the alloy may be used, interchanging same as needed. Holes in the alloy (F) are placed as follows: (a), the plate is flushfitted for bolting to the plate (C), as shown; (b), after countersinking for bolts or screws the edges around the bolt holes are taken off (in the drill press), to guard against the hard metal scratching the sheet worked; (c), the plate is bolted to (C); (d), a center punch fitting tightly into the punch holes is used to mark centers for holes in the plate (F); (e), marking is done after the two plates (B) and (C) have been arranged one upon the other (with the rubber removed); and (f), the holes are then drilled 1/64" *smaller*, in the unbolted plate (F), and reamed through the punch holes in (B), after realignment.

Alignment of Plates

In Fig. 2 is shown a Kirksite plate, containing one single row of holes, with heads of the down-holding screws buried in the metal to prevent their scratching the sheet processed

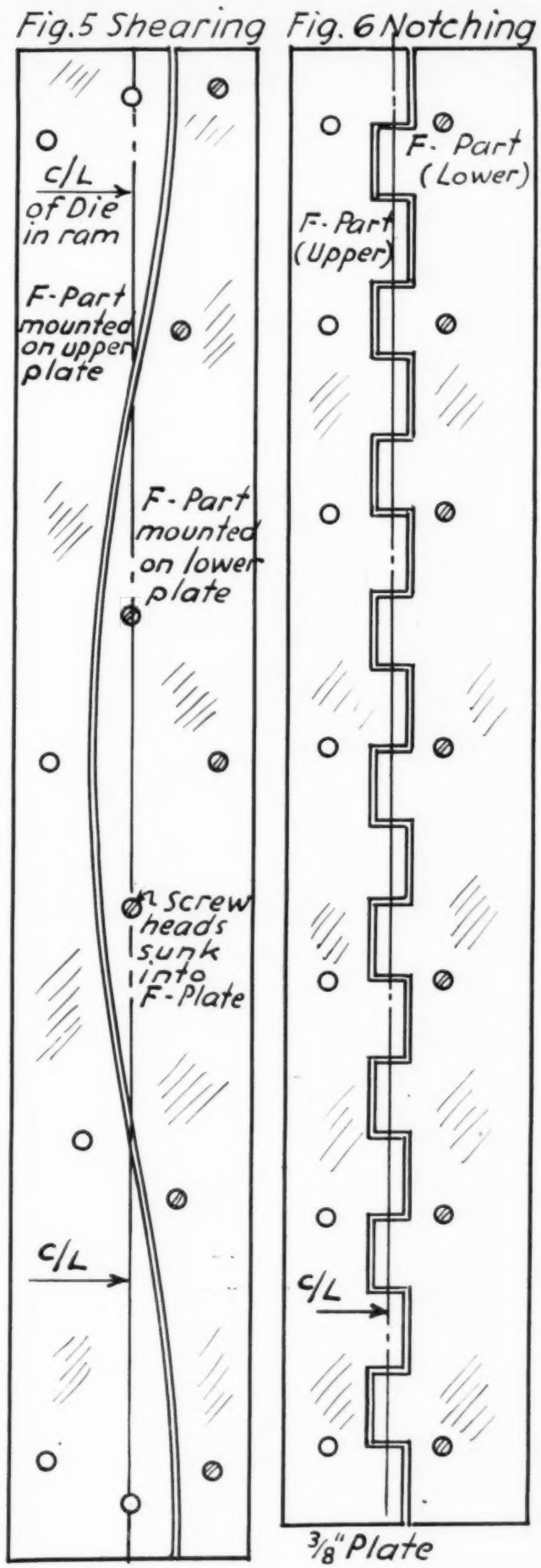
over them. In Fig. 3 is shown a wider strip of the alloy, with three rows of various size holes provided in it. The plate may be shifted for centering the row of holes momentarily employed above the slot (G), in the brake bed, as indicated in Fig. 4. If we want to use more than one row of holes at the same time, we can place the plate (F) over a desired thickness steel plate in which the corresponding holes are drilled twice-the-size of the punch, or holes to be punched, these larger holes to receive the slugs. But inasmuch as it is best for the *brake* to have the working area *centered* immediately below the middle of the ram, the shifting of the plate (F), as indicated at 1, 2, 3, in Fig. 4, is deemed preferable, the more so, because if we do large punching away from the ram-center we would have to use "bolsters," such as shown in Fig. 8. On the other hand, the shifting of the plate (F) might result in bad alignment of the holes below the punches, so that the alternative of the slug-receiving plate under (F) might prove the safer.

Production of Plates

In Fig. 5 is illustrated the employment of Kirksite plates for *shearing* on curved lines, and for *notchouts*. These operations are done in a fixture similar to that shown in Fig. 1, and the die-making for this work is considerably simpler than in the foregoing hole-punching requirement. In the making of the dies shown in Fig. 5 and 6, we make a sheet metal pattern first, observing that it be correct and accurate for the work at hand. Next, we select the right width of a strip of the alloy (F), providing a sufficient margin laterally from the cutting lines, for bolting the plates. The sheet metal pattern is secured over the Kirksite plate, and the cutting lines are marked by a sharp pointed instrument (hardened steel scratchall). Then we saw along the scratched line, so that the line itself is visible throughout the operation. After the plate is sawed in two, as may be called for by the pattern, smooth the cut with files, using the pattern as guide, and in filing the actual cutting edge is left protruding over the rest of the thickness of the metal. Both halves are thus processed, and there need be no waste of the material. The two halves are then aligned upon the plate (C), as shown in Fig. 5 and 6, and the one half of (F) is bolted to the plate (C), while the other half is marked for bolting holes through holes contained in the plate (B). In marking these holes, the procedure described under punching-holes location is followed. Obviously in aligning the plates (F) we shall observe the centering of the cutting lines under the ram, as shown at C/L in the drawings. If we use *thicker* plate (F), we need *fewer* hold-down bolts or screws, and the number of them depends on whether the plate would bend and bind against the other plate, in shearing. The hold-downs should be placed as near as practical to the cutting edge, but not nearer than one inch.

Die Bolsters

Shearing of circular shapes, discs, bottoms and the like, is shown in Figs. 7 to 11. For this shearing, because the pressure of the ram must be exercised sideways from its center, bolstering means as shown in Fig. 8 are recommended. These bolsters are simple angles of ¼" material, braked on two sides for flanges, one of which bolts to the upper (B) plate. The side of the bolster left without a flange fits tight against the metal of the ram, the ram moving between two reciprocating bolsters. For heavy work it is best to use several pairs of the bolsters, and if the dies extend beyond the width of the plates (B) and (C), of the fixture shown in Fig. 1, or similar, corresponding size and thickness steel plates must



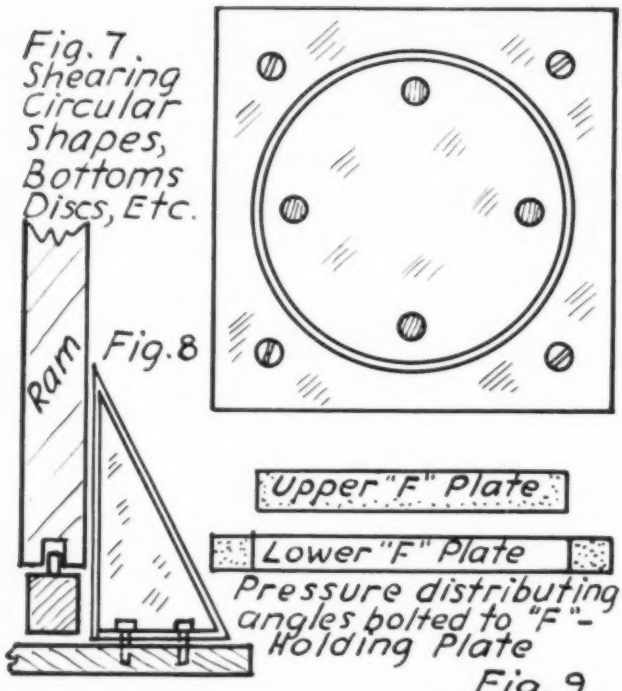


Fig. 9

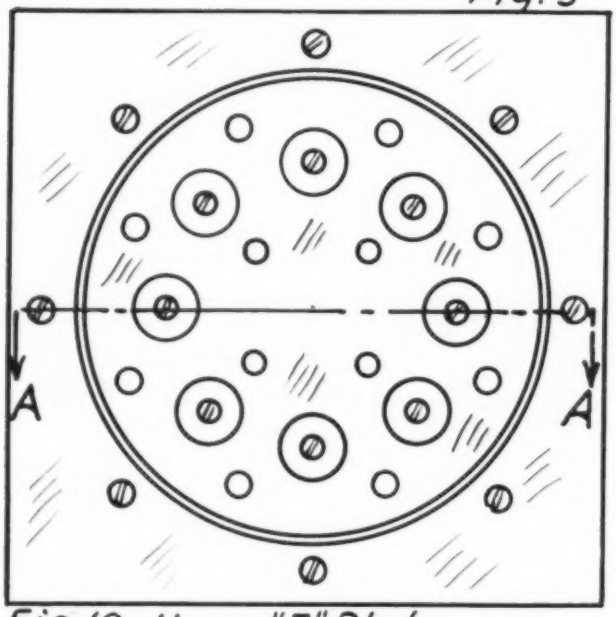
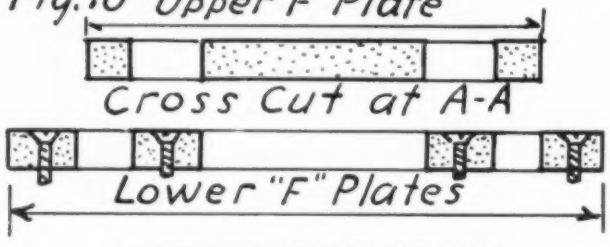
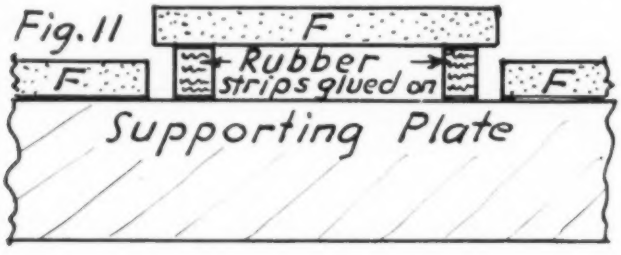


Fig. 10 Upper "F" Plate





be used, bolted to (B) and (C) so that the plates (F) can be bolted to these auxiliary plates. In this connection it must be considered that the Fixture Fig. 1 is not in any way secured to the bed or the ram of the brake, but rests loosely over the die-bed of the brake, and can be moved by lifting. If there is work to be done which would necessitate wider plates (B) and (C), or auxiliary wider plates, these can be provided without interfering, except for added weight, with the setting up and removal of the fixture.

Variety of Dies Possible

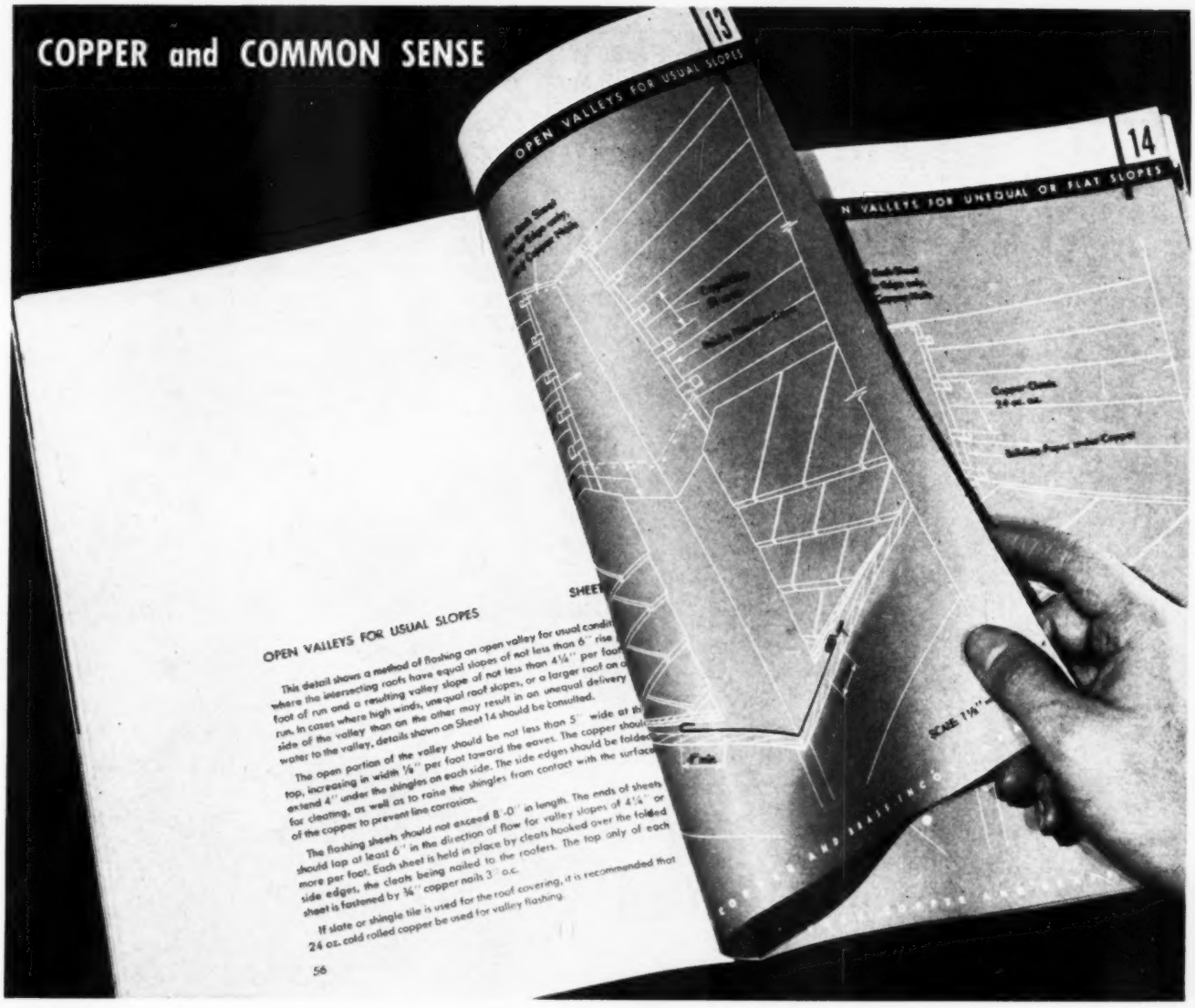
In the several drawings only a few of patterns shown would be practical to process as described. It will become apparent from the drawings and the description, that by the means discussed many other shapes can be sheared, or notched, or variously distributed holes can be punched, as may be apprehended in looking at the sample, Fig. 9. This work has been previously dealt with, under the Steel Plate Dies figures and text, and here we deal with that same work, with the difference that here the work is done by dies of different metal, one that will *cut without being heat-treated*. It is also to be considered that these plate dies, be they steel or alloy, are not manufactured or supplied by anyone, and that the shop will be called upon to make them locally.

Alloy Characteristics

The alloy, under the name of Kirksite A, is being produced in plates, or sheets, in thicknesses from 5/32" to 1", in sizes up to 60" x 144". The material weighs 1 pound per 4 cubic inches, or, 16 square inches in the ¼" thickness. Its tensile strength is 54,000 lbs. per square inch with grain, and 59,000 lbs. across grain. Its hardness is Superficial Rockwell, 88. It is an alloy of high grade zinc having certain proportions of aluminum, copper and magnesium. Its compressive strength is from 60,000 to 75,000 lbs. per square inch. It is of note that 2,000 blanks of 1/16" thick duraluminum have been cut with one single plate-set as shown in Fig. 5, of the drawings.

A great advantage of this alloy is that it can be welded or its cutting edges can be weld-repaired, with no after-affects. This welding is done by using thin sticks or rods of the same material (Kirksite A), for welding rod. A flux of zinc ammonium chloride may be used, but other fluxes are available. The melting point of the allow is about 775 degrees Fahrenheit, so that flame-welding is easily accomplished. In repairing an inaccurately cut die or repairing a damaged die, the so-called "build-up" by welding is employed, fusing enough of the metal to the portion of the die to be repaired to have enough for a new cut or for drilling a new hole and grinding off the surplus. In large area repairing it is best to weld on a continuous strip, but in "hole" repairing the filling of the hole with the "weld" is the easiest. The weld, being of the same material as is the die, and the welding process not damaging the hardness or the cutting properties of the metal, it can be seen that there need be very little scrapping of the dies. A further inducement to users of Kirksite A is offered by its makers in that they will take back all unused or discarded plates, allowing a fair price for such returned material. One disadvantage there is: the alloy is too hard to be cut on sheet metal shears; it must be bandsawed.

The price of Kirksite A is governed by the prevailing price of prime zinc. But inasmuch as zinc weighs 100 lbs. to only 69 lbs. of the alloy, the cost per a given volume (square inches of certain thickness) would be about the same. Machining properties of Kirksite are such as to permit grinding and filing of the cuts without the tools filling up easily.



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ANSWER: See pages 56 to 59 in "Copper and Common Sense."

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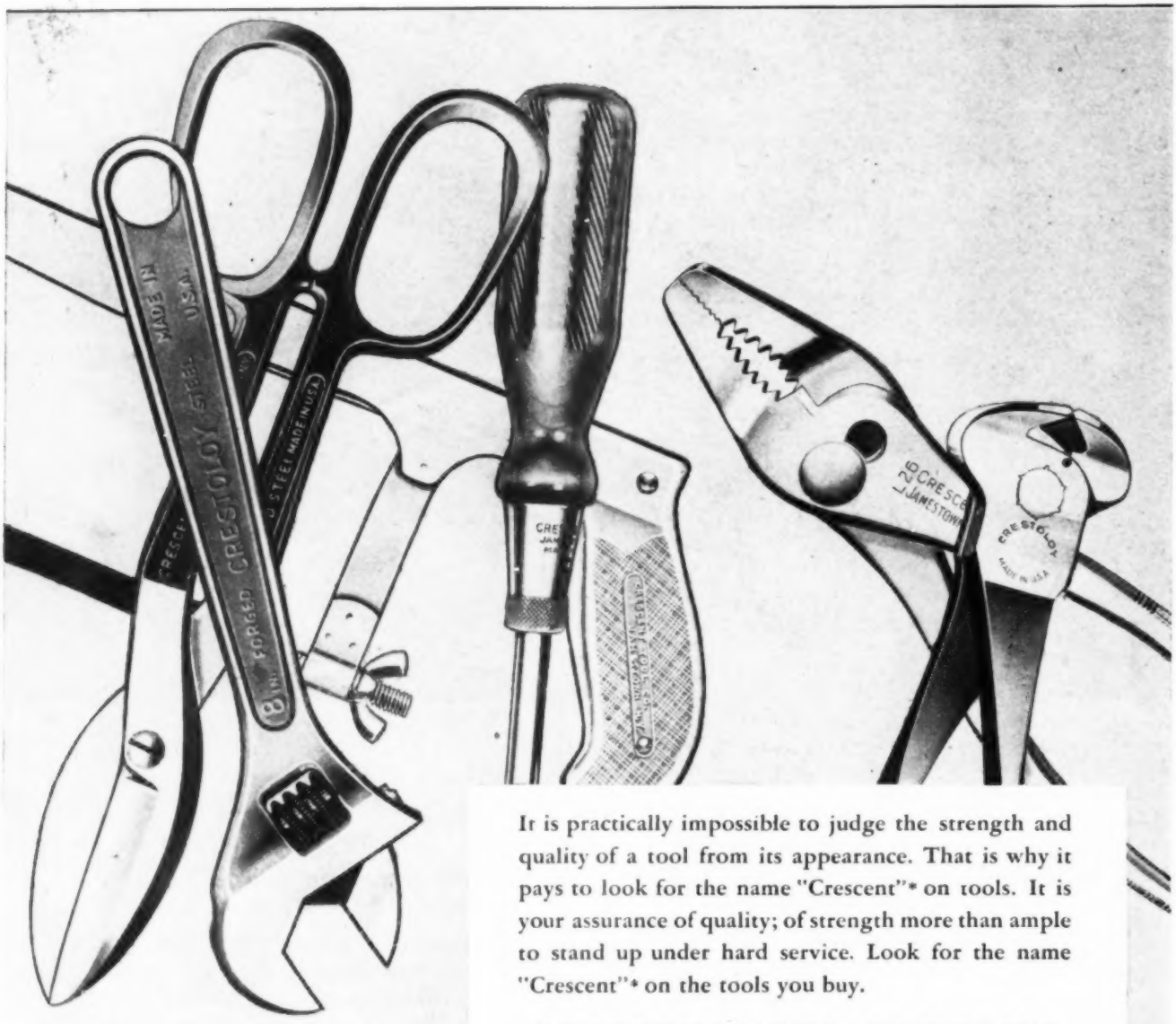

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Bonus Plan of National Cornice Works keeps Key Men Satisfied

THIRTY-SIX years ago, in 1911, W. H. C. Ness founded National Cornice Works in Los Angeles; in the years since its founding the firm has expanded and maintained pace with the changing aspects of the sheet metal business to become, today, one of the recognized leading shops on the west coast, fabricating and erecting long established items like skylights and cornices and architectural sheet metal work and, in late years, specializing in industrial work such as spray booths, fire doors, ventilating systems, metal stampings, kitchen equipment, etc.

In 1914 the business was incorporated. About 1921 Mr. Ness conceived the idea of sharing profits with certain key employees; after considering various plans he instituted a profit sharing program providing for distribution of a certain per cent of all profits after reserving 8 per cent for the outstanding stock of the corporation.

The Distribution Plan

The bonus, determined as above, is distributed among the executive officers and employees who, in the opinion of the president, are in a position to and do contribute effort over and above what is considered their normal duties. Payment is not made in one lump sum, but is disbursed in equal payments over a period of ten months, beginning with a first payment in March and ending with December in the year following declaration of the bonus.

Certain provisions are incorporated in the agreement. Any employee who leaves the company after March 15 of his own volition, forfeits all remaining payments. On the other hand, if the company dispenses with the services of a participating employee, the employee is paid immediately the full remaining payments. In the event of a total or permanent disability to a participating employee, all remaining bonus payments become due and payable immediately upon proof of such disability. In the event of death to any participating employee, all payments become immediately payable to his estate.

This bonus plan, according to Mr. Ness, has some other advantages; payment extended over ten months does not tend to deplete the working capital of the company. The plan has proved a definite incentive for a participating employee to stay with the company. The record of the plan shows that while employees may get offers from other companies—even at higher pay—it seldom happens that the higher offer equals the employees present income plus the bonus payments from a good year. Also, employees thinking of changing jobs usually estimate what they will get from the bonus in view of the company's volume of business and unless business looks very bad will choose to remain.

Plan Holds Good Men

The plan has another point of interest. In bad times competitors seldom make offers. In good times such offers become frequent and a competitor needing a man badly often makes an offer which tops the going scale for good men. Without a bonus plan, an employee may be inclined to give such an offer serious consideration, even though he realizes that the offer may not be permanent. But with a bonus plan in operation, this same employee expects or hopes that his combined wage and bonus will equal or top the offer.

Further, since the bonus takes care of such "good times" offers and since such offers do not come in bad times, the bonus plan permits the employer, if he desires, to establish rates somewhat below the highest rates in the area—this is an advantage in bad times, while the bonus keeps the employee satisfied in good times.

The plan, of course, was checked in the beginning for legality and has been examined from time to time to keep it in conformance with recent regulations of the tax bodies and treasury rulings.

◆

Undistributed Corporate Earnings

THE TREASURY has added two new questions to the 1946 corporate return (Form 1120) asking: (1) Were 70 per cent of the year's earnings distributed; (2) If not, why not?

Treasury says this does not mean a new "drive" to enforce the 27½ and 38½ per cent penalty on unreasonably accumulated earnings, but it is a fact that Treasury's agents have always had standing instructions to examine corporate returns for unreasonable accumulations of earnings. This was a dead issue during the war because most any firm could think up reasons for having cash on hand.

If this action materializes, it means that whereas formerly agents had to dig out the facts, now the firm must report accumulations. So a firm now has to show its hand when it reports. The Republicans have said they do not propose to question this Treasury ruling.

Up to now, accumulating 70 per cent of profits has been a rough guide to "unreasonable accumulations," but this 70 per cent is not legal terminology—no percentage is stated in the law—so business men had best examine their report and seek advice.

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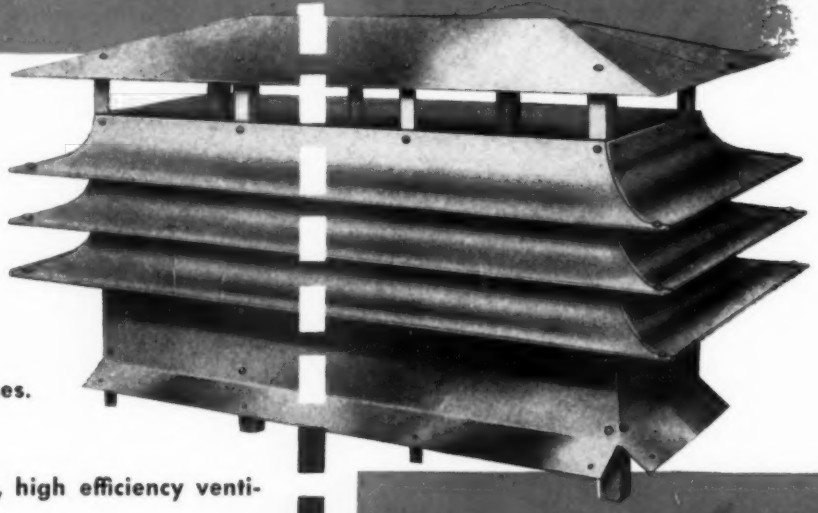

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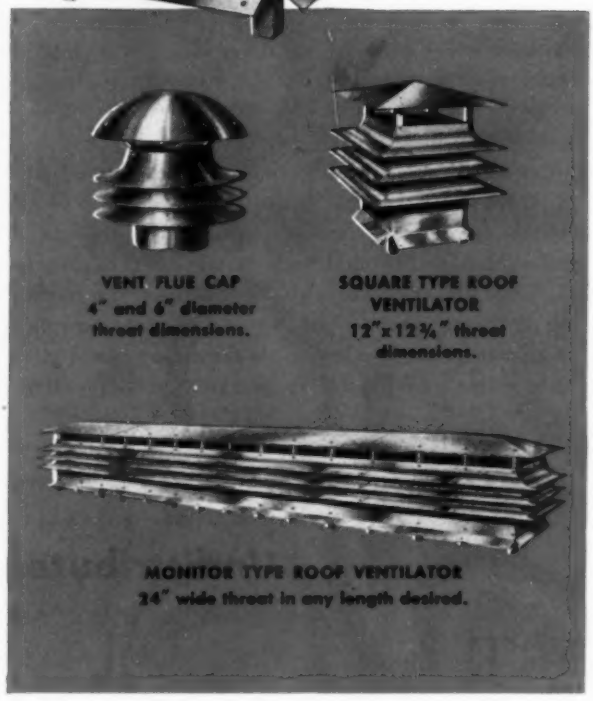

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ASSOCIATION ACTIVITIES

Indoor Comfort Conferences

THE Steering Committee of the Application Engineering Committee (John W. Norris, W. D. Redrup and J. R. Scott) has approved the newly-expanded, visualized Indoor Comfort program which has been developed for dealers for the coming year. The Conferences have been arranged for the use of visual aids, including sound slide films and it seems to be the general feeling that an even better job will be done by this medium of training than before.

In connection with the Conferences the Association has announced that it has engaged the services of Robert J. Waalkes, a graduate of Michigan State College, who will assist in the work involved in the Conferences and will also handle promotional work with dealers and all dealer correspondence.

G. A. Voorhees, Application Engineering Director, has released a schedule of the Conferences that are to be held in the first five months of 1947. The tuition fee for these Conferences is $10.00 for each person attending, with the exception that each member of the Association need only pay $5.00 for every person they send.

Following is the proposed itinerary as of Dec. 2, 1946. Changes may be necessary because of conditions beyond control, such as (1) conventions or other gatherings which would leave no hotel rooms available for out-of-town dealers attending the meeting; (2) lack of reasonable assurance of an attendance of about 100 (or more) at each Indoor Comfort Conference.

January 6 and 7	Detroit
January 23 and 24	Toledo
February 6 and 7	Cincinnati
February 10 and 11	Louisville
February 13 and 14	Evansville
February 20 and 21	Memphis
February 24 and 25	Birmingham
February 27 and 28	Atlanta
March 6 and 7	Richmond or Washington, D. C.
March 10 and 11	Baltimore
March 13 and 14	Philadelphia
March 17 and 18	Newark
March 24 and 25	New Haven or Hartford
March 31 and April 1	Boston
April 7 and 8	Rochester
April 10 and 11	Buffalo
April 17 and 18	Cleveland
April 21 and 22	Pittsburgh
April 24 and 25	Columbus

April 29, Warm Air Heating Forum, Sheet Metal Contractors National Association, Chicago.

May 5 and 6	St. Louis
May 8 and 9	Kansas City
May 12 and 13	Omaha
May 15 and 16	Des Moines
May 19 and 20	Minneapolis-St. Paul
May 26 and 27	Milwaukee

If any Association member feels that his area will support a Conference (Attendance of at least 100) and it is not on the schedule, the Committee will try to arrange for a Conference upon request.

Buffalo

AT the December meeting, the Buffalo Warm Air Heating Association elected the following officers for 1947:

Leo J. Olear, *President*
M. J. Rodman, *1st V. P.*
L. J. Monahan, *2nd V. P.*
L. J. Wieman, *Sec'y*
Martin A. Turner, *Fin. Sec'y*
Stanley J. Berny, *Treas.*
Edwin Hehr, *Governor*

Members were warned against overemphasis on sales since heating installations require quite different sales technique than appliances. Most appliances are not necessities and a desire must be created but heating installation sales consist of selling a certain type only, no creative selling is needed. Also, the mark-up on heating units, usually, is not sufficient to support extensive selling campaigns on the part of the contractor. Such operations were conducted in this area about twelve years ago with unsatisfactory results from a profit standpoint.

Most warm air contractors accept slack winter periods as a necessary evil of their business, but during this past year, the local group has been receiving lectures on types of contracts they can solicit for winter work. At this particular meeting, the benefits of attic fans were explained. Members were urged to attempt to interest their heating customers since it provides work for them during the slack season. Attendance — 63.

M. J. Rodman, *Sec'y*

Coming Conventions and Meetings

Feb. 3-4—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. Antlers Hotel, Indianapolis. Annual. Homer Selch, Secretary, 944 Hosbrook St., Indianapolis 3, Ind.

Feb. 10-12—Sheet Metal Contractors' Association of Wisconsin, Inc. 32nd Annual. Schroeder Hotel, Milwaukee. Paul L. Biersach, Secretary, 225 E. Michigan, Milwaukee.

March 24-26—Ohio Sheet Metal Contractors' Association. Annual. Commodore Perry Hotel, Toledo. W. E. Bogen, Secretary, 334 E. Livingston Ave., Columbus.

March 24-25—Sheet Metal Contractors' Association of Illinois, Annual. Jefferson Hotel, Peoria. W. Rex Shaw, Secretary, 695 E. State, Jacksonville.

April 8-9—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Annual. Clarence J. Meyer, Secretary, 567 Genesee St., Buffalo 4, N. Y.

April 28-30—Sheet Metal Contractors' National Association, Annual. Stevens Hotel, Chicago, Ill. Clarence J. Meyer, National Secretary, 567 Genesee St., Buffalo 4, N. Y.

June 16-18—Stoker Manufacturers' Association, Annual. Lookout Mountain Hotel, Lookout Mountain, Tenn.

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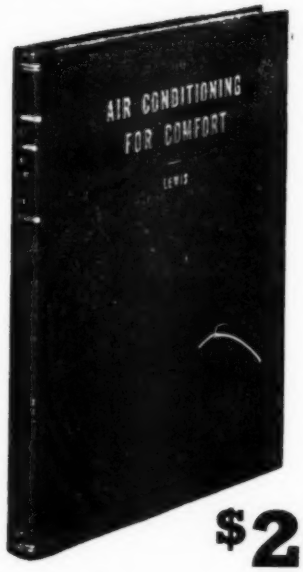

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Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Several complete examples of correct design procedure are given, together with forms for recording the design data, the proper filling-in of which are explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and chart in order to render both devices thoroughly understandable.

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CHAP. 6—Humidity Controllers and Control
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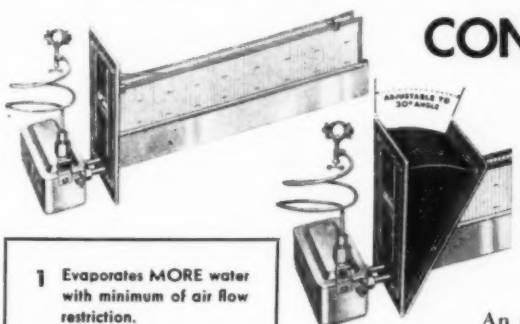

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1. Evaporates MORE water with minimum of air flow restriction.
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3. Non back-siphoning water feed valve fully approved by National Plumbing Laboratory.
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An amazing device—fast in action—trouble-free in operation! Built in 2 types as shown; 12 sizes. Easily installed in any furnace with either straight or sloping plenum. Equipped with patented replaceable evaporator pads, and self-locking front plate—quickly serviced. Copper trough holds very small amount of water—rapid evaporation even with short firing cycles. Fully automatic. Entirely non-corrosive. Ideal for automatic installations.

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For Winter Air Conditioning Furnaces

Patented hinged wing construction greatly increases rate of evaporation—far more efficient than ordinary types. Bronze pan transfers heat more rapidly and withstands corrosion. Water line adjustable by means of thumb screw located on float valve. For installation in either straight or sloping plenum furnaces. Two sizes with 26″ and 36″ pans. Large size has heating area of over 33 sq. in.—sufficient to humidify up to 12,000 cu. ft. of space.

Furnished complete with necessary fittings and installation instructions.

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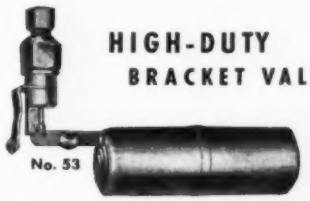
No. 52

HIGH-DUTY WATER-BOY FEEDER

Same general design as No. 51—but built with heavier and larger valve capacity. Recommended for pressures up to 125 lbs., handling 1½ gals. per minute at 75 lbs. pressure. Fully adjustable.



HIGH-DUTY BRACKET VALVE

No. 53

Same construction, same capacities, and for same services as High-Duty Water-Boy Feeder, No. 52. Only difference is vertical mounting of valve as shown. Overall length of valve 5⅜″.

WATER-BOY FEED VALVE With Adjustable Water Line

No. 5900F

Complete unit enabling you to convert any hand fed pan into an automatic humidifier. Easily and quickly installed. Equipped with non back-siphoning supply valve and float, adjustable for varying water pressures. Shipped complete with fittings and instructions.

★ ★ ★

SEE OUR EXHIBIT—BOOTH 441 at Cleveland Air Conditioning Show

MAID-O'-MIST, INC. . . . 3213 N. PULASKI RD. . . . CHICAGO 41, ILLINOIS

Association Activities . . .

Indoor Comfort—Dealer Division

THE National Warm Air Heating and Air Conditioning Association has sent a release to the members of its Dealer Division listing for them the projects in which the Association has been engaged for the last year. It detailed the things which have been done to make the Indoor Comfort Conferences the best training schools possible.

Also the dealers were urged to attend the January Convention, if they can find the time to do so. The new schedule of dues for Dealer Members was announced and the release likewise included the Objectives for Dealer Members of the Association for 1947. These are listed below.

Schedule of Annual Dues for 1947

Dues are to be based upon the number of furnaces and/or winter air conditioning units sold in *1946*, whether for replacement, modernization, or new building.

A—Up to 25 Furnaces	$ 25.00
B— 26 to 50 Furnaces	50.00
C— 51 to 75 Furnaces	75.00
D— 76 to 100 Furnaces	100.00
E—101 to 125 Furnaces	125.00
F—126 and Over	150.00

Objectives for Dealer Members for 1947

1. To promote Dealer Membership in the National Warm Air Heating and Air Conditioning Association.
2. To encourage the formulation of local organizations to promote high standards of installation and general business ethics in their local communities.
3. Through these local organizations, to promote, advertise and publicize locally the story of "Indoor Comfort" and all activities of the National Warm Air Heating and Air Conditioning Association to the public, architects, governmental agencies, building industry, schools and public utilities. Also to cooperate with municipal authorities in the adoption of satisfactory building codes for the protection of the public.
4. To encourage the tie-in of the activities of all local groups with the activities of the national association.
5. To utilize all materials and aids developed and disseminated by the National Warm Air Heating and Air Conditioning Association, such as engineering publications, school, promotional and advertising materials, etc.
6. To support and cooperate with the National Association in developing and holding local Indoor Comfort Conferences.
7. Through active local organizations in communities of each state to increase their local membership and to cooperate in promoting local organizations in other communities.

●

Minneapolis

THE city of Minneapolis has recently formed an association known as the Minneapolis Sheet Metal, Heating and Air Conditioning Association and officers have been elected. These are: F. W. Legler, president, A. B. Osgood, vice-president, Elwin L. Knowles, treasurer, Thos. F. Burniece, secretary. Chairmen of the committees are as follows: Membership, Ray N. Welter, Program, A. B. Osgood, Grievance, Christian F. Petersen, Apprentice, E. R. Carlson and Telephone, C. O. Carlson.

Mr. Legler had an interesting exchange of letters with the Inspector of Buildings of Minneapolis. This city has had a reputation for being strict about observance of its building regulations but it would seem that the Association feels that it was too strict in this instance.

CITY OF MINNEAPOLIS
DEPARTMENT OF BUILDINGS
213 City Hall
John E. Nelson, Inspector of Buildings

October 10, 1946

TO ALL CLASS "A" GAS FITTERS:

Our attention has been called to the practice of installing and connecting mechanical warm air gas heating furnaces without the motor and required safety controls. This practice constitutes a definite fire and life hazard, and must be discontinued at once.

You are, therefore, hereby notified to discontinue as of this date the connection of any gas piping to mechanical warm air furnaces, if such furnace is not completely equipped with motor and all necessary safety and operating controls.

(signed)
JOHN E. NELSON
Inspector of Buildings
ARTHUR P. SPOTTSWOOD
Chief, Fire Prevention Bureau

Copies to all Mechanical Warm air heating installers.

October 11, 1946

Mr. John E. Nelson
Inspector of Buildings
213 City Hall
Minneapolis, Minnesota
Dear Sir:

This acknowledges your letter of October 10th.

We are in perfect agreement with you that a mechanical warm air furnace without controls and blower motor constitutes a fire hazard and such an installation should not be made.

We cannot agree, however, that such an installation with controls but without blower motor is a fire or health hazard.

Several hundred homes with mechanical warm air heating systems are being heated without blower motors. Many families are occupying homes now which have such heating plants and who would not be able to continue living in these homes if your order were carried out as now written.

We feel that your order is based on information which is not according to fact, and, if allowed to stand as written, will cause untold hardships to families depending on their heating plant without blower motor as the only means of heat.

A mechanical warm air heating system without blower motor is a safe heating plant if installed with limit control, and if the blower and the filters have been removed.

We will obey your order under protest and will refer all complaints from people who must suffer under your order to your office.

Sincerely yours,
THE WATERBURY COMPANY
BY
President

F. W. Legler: AL

●

The Carolinas

THE Carolinas Roofing and Sheet Metal Contractors Association held its Semi-Annual Convention in Columbia S. C. on December 5, 1946. Although it was only a one-day meeting, it was well attended with 82 members and guests present.

All Committee reports indicated that the Association was in the healthiest condition of its existence and ambitious plans are being made for the Semi-Annual Convention in June. Scheduled for the 12th and 13th it is expected to be the largest Convention the Carolinas ever had.

The Carolinas Association showed its concern over the bad effect on the industry that is brought about by the escalator clauses being used by some manufacturers in a resolution that manufacturers and contractors combine to establish firm prices to prevail for a certain period. If advances in those prices should be necessary then due notice could be given all interested parties.

Joe H. Piper
Secretary and Treasurer

●

Indoor Climate Institute

THE Indoor Climate Institute was founded in 1943 with the avowed purpose of informing the public of the benefits to be derived from central heating and automatic firing. A continuing attempt was made to bring all sections of the heating industry to a meeting place from which they would all proceed toward the same objective, a campaign stressing the theme of automatic firing.

Various portions of the industry have initiated their own publicity and merchandising movements and for this reason the Institute felt that the need for its services was no longer as great as had been the case in 1943. Thus, a decision was made to suspend the operation of the Indoor Climate Institute, as of December 1, 1946.

MAYFLOWER AIR-CONDITIONERS, INC.
St. Paul Minnesota

Association Activities . .

Minnesota Forms New State Ass'n

ON December 6, in a one-day meeting, contractors from St. Paul, Minneapolis, and most of other busy cities of Minnesota gathered in St. Paul and within a matter of hours established a new Sheet Metal and Roofing Contractors' Ass'n of Minnesota. Officers elected for one year are:

President—C. E. Parriott, St. Paul
1st V. P.—Frederick W. Legler, Minneapolis
2nd V. P.—Richard Walsh, St. Paul
3rd V. P.—L. B. Hill, Austin
4th V. P.—Lester Peterson, Duluth
5th V. P.—Dwight Johnson, Wilmar
Secretary—Thomas Burniece, Jr., Minneapolis
Treasurer—Bud Helle, St. Paul
Sgt.-at-Arms—Harry Quade, Minneapolis

Such quick formation did not come, of course, without much preliminary work. For many months the officers and members of the St. Paul association encouraged by officers and committeemen of the Sheet Metal Contractors National Ass'n—Richard Walsh, Clyde Parriott, Roy Dose, together with committeemen and national association members from Minneapolis—K. A. Cronstrom and others—had been working out a program and, through a joint committee, developing Articles of Incorporation and a Constitution and By-Laws. By the time of the December 6 meeting all these preliminary details had been completed so it was necessary only to submit the proposal for adoption.

National Vice President Walsh opened the meeting and asked Minneapolis president F. W. Legler to act as presiding officer. The meeting voted Clyde Parriott temporary chairman to serve during the organizing proceedings, with Tom Burniece as temporary secretary.

Orton Presents Aims of National

National Publicity and Membership Committee Chairman Harvey Orton of Barberton, Ohio extended the wishes of the National for a successful state association and expressed confidence that this new state association would very quickly establish itself as a powerful influence in National affairs. Mr. Orton described the activities of the old National with its 4,000 members and then explained the early gatherings of officers from state associations of New York, Ohio, Wisconsin, Michigan to discuss ways and means of reviving the National association, leading within a few months to the formation of the present National organization. He said present membership is approaching the 1,000 mark with members in some 40 states. He stated the organization of a new state association in Minnesota should result in encouraging other states to form new state associations and local groups to form local associations.

Experience has shown, Mr. Orton stated, that it is a mistake to keep in office certain hard working individuals—officers and directors and committee members should be rotated frequently and young men should be encouraged to become members and participate in all association activities—only if new faces and new blood are encourged can an organization progress. It is also a mistake, he said, to divide local or state associations into common-interest groups—instead the association should plan for and see to it that all activities in our field are made a part of the association's program. As an example of things a live local can do, Mr. Orton cited his own Akron local—in Akron the local association was instrumental in getting a heating code and licensing ordinance; the aim is to make every heating job completely satisfactory; to that end the Akron local members have just spent $1500 in newspaper advertising suggesting that the members listed in each advertisement be consulted for heating work. Locals can also interest themselves in means for obtaining better heating installations and acceptable sheet metal construcion.

Roy Dose Presents Labor Problems

Roy Dose, member of the Labor Relations Committee of the National association described the labor relations program formulated in St. Louis last spring and the system of operation wherein national committee members serve as regional labor relations committee chairmen with local committee members under them. A problem in labor relations, explained Mr. Dose, arising in one town is referred to the local labor relations committee if such exists or to the regional committee. This committee, composed of representatives of management and labor considers the case and issues a ruling. If all parties agree to the ruling the matter is settled, if objection is raised the problem is taken before the National committee.

Mr. Dose described preliminary work to form a Minneapolis Building Trades Council composed of members of labor or-

(Continued on Page 226)

Unique Designs Achieved Through Arc Welding

By ROBERT NEWTON, Welding Engineer
The Lincoln Electric Co.
Minneapolis, Minn.

STRONG-SCOTT MFG. CO., Minneapolis, Minn., has won an enviable reputation for its designs of sheet metal equipment. One product is the coal pulvo assembly (Fig. 1) which burns solid fuels in suspension.

Some of the parts of this equipment are shown in Fig. 2. The part on the left and in the center is a spinner. The vanes are fillet-welded to the round base plate with ⅛" "Fleetweld 7" electrode.

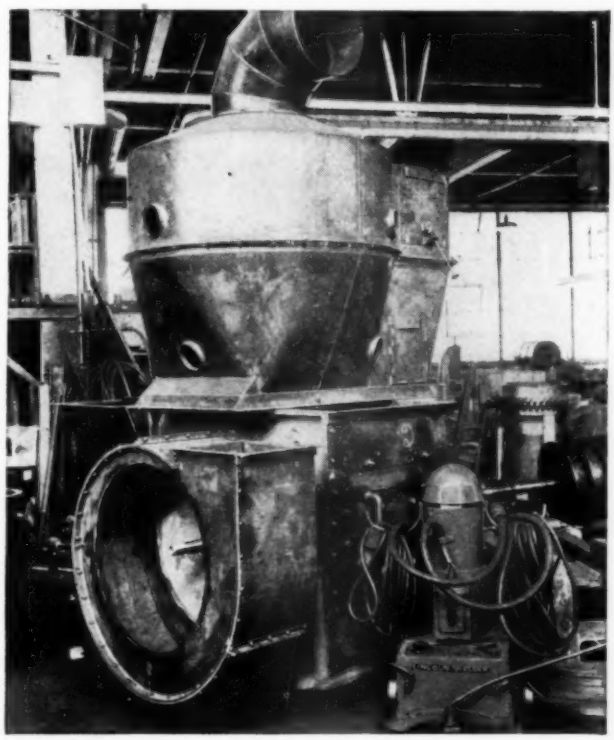


Fig. 1. Pulvo assembly of welded construction.

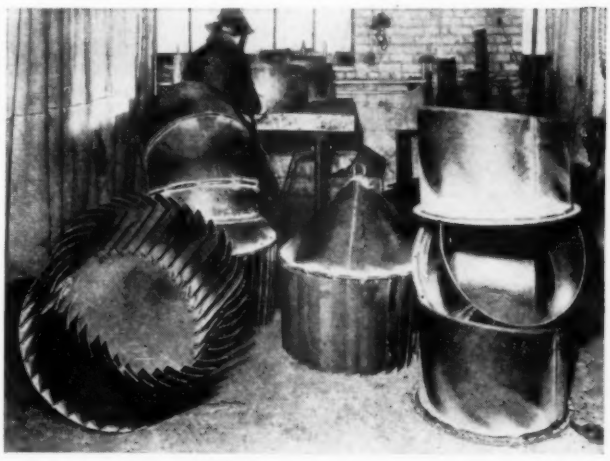


Fig. 2. Some of the parts of the pulvo.

The parts on the right are flange connections made from a ¼" x 1½" flat band iron ring, fillet-welded to a pipe section made from 10-gauge sheet. The elbows are butt-welded from 8-gauge iron.

A distributing cone is shown in Fig. 3. The ring is ⅜" x 3" iron. The vanes, fillet-welded to the band ring, are 12-gauge 18-8 stainless steel.

All welding is done with a "Shield-Arc Jr." (shown in Fig. 1 and Fig. 4) and with "Fleetweld 7" electrode.

For full details on the "Shield-Arc Jr.", write for a free copy of Bul. 363. The Lincoln Electric Company, Dept. 171, Cleveland 1, Ohio.

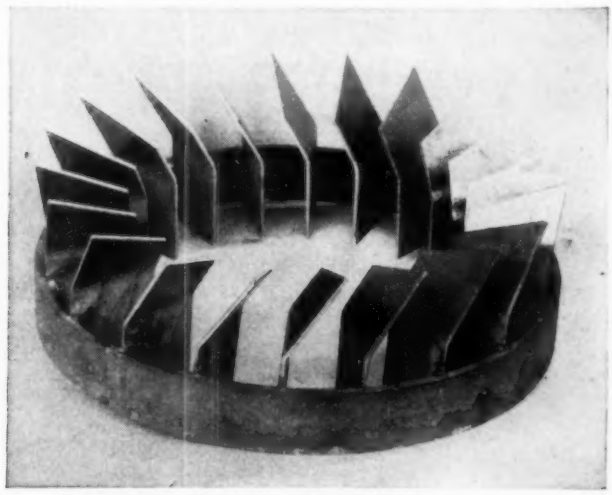


Fig. 3. Distributing cone.

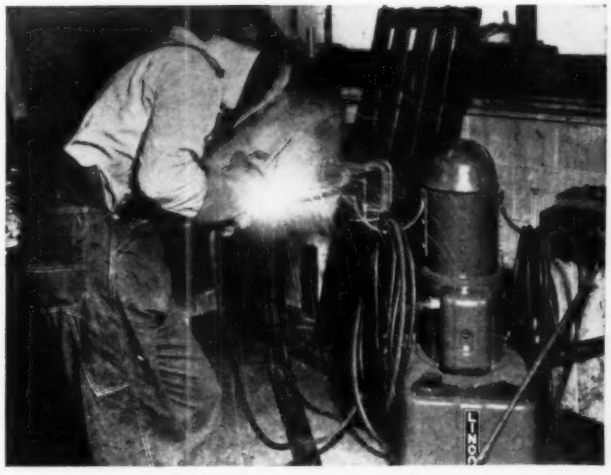


Fig. 4. Welding a flange connection.

Advertisement

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A Complete reprint, under one cover, of Professor S. Konzo's invaluable series of articles—

The "HOW, WHAT AND WHY"

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WINTER AIR CONDITIONING MANUAL

Everyone who is now using or expects to use the new "Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems" will find Professor Konzo's series a source of much practical help in understanding the Code and correctly applying it to actual jobs. In this great series, Professor Konzo not only explains step by step exactly how to use the Code, but, in addition, tells in detail of the research and experience that is behind each step in the suggested procedures.

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Get one of the first copies of this important reprint booklet by placing your order now. The initial copies will be ready for distribution very shortly. Send your order to the address below.

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STABILITY

MR. DEALER...LOOK TO THE LEADER FOR SATISFACTION IN EVERY WAY

When you make a tie-in with a manufacturer you want to know that that manufacturer has stability and permanence as well as a fine product. Silver Flame is America's recognized leader in the entire industry, featured by 14 great Public Utilities! There still remain some important territories open for distributorship. Inquire today!

SILVER FLAME

America's Leading

GAS CONVERSION BURNER

MORE FINE SELLING FEATURES

THAN ANY OTHER BURNER BUILT!

(HERE ARE BUT A FEW OF THEM)

- *The ONE burner that operates perfectly on all three gases: Natural, Butane, Manufactured!*
- *The ONE burner sold with a 3 YEAR PARTS GUARANTEE!*
- *Operates on about 1/3 normal fuel flow.*
- *Automatic Safety Pilot seals gas valve unless light is burning PERFECTLY!*
- *Automatic Gas Valves controlled by room thermostat.*
- *Automatic Gas Pressure Regulator maintains efficient flame always.*
- *Trouble-free! Care-free!*

CERTIFIED

¾" and 1" SOLENOID VALVES

IMMEDIATE DELIVERY

For manufactured, natural or butane gas, AGA certified.

SEND ORDERS TO:
7020 FENKELL
DETROIT 21, MICH.

FOR AVAILABLE DISTRIBUTORSHIPS . . . WRITE, WIRE OR PHONE

SILVER FLAME INC.

7020 FENKELL, DETROIT 21, MICH.

UNiversity 1-1411

Dependable Controls

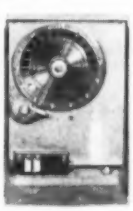
by *Paragon*

assures satisfied Heating Customers

When you sell and install Paragon Time Switches as part of your heating and air conditioning jobs you gain customer satisfaction. Paragon Timers are easy to install and ruggedly built for long life . . . which means fewer service calls and less upkeep. Five popular series numbers are illustrated and described below. Look over the list and order from your jobber. He stocks Paragon Time Controls.

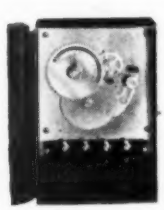
700 Series—These are the 7-day calendar dial time switches, providing daily settings on an individual basis. Thus week-end and Holiday operations of equipment can be omitted without interrupting the regular schedule during the remainder of the week. Large 6″ dial permits settings as close together as 3 hours. Day and night periods are clearly marked. This is a flexible and versatile instrument and finds great favor in heating, ventilating and air conditioning.

300 Series—The 300 Series Switches contain 24-hour dials for regular, repetitive, automatic control of signs, commercial lighting, stokers, oil burners, blowers, motors, etc. Regularly supplied with 3000 Watts per pole capacity, for 60 cycle, 115 or 230 Volt current. Skip trip feature permits either "on" or "off" manual operation ahead of automatic setting.



100 Series—These "one day" timers are designed for direct 24-hour control of air conditioning equipment and heating installations, including stokers, oil burners and gas furnaces. Threaded pins may be set for operations as close as 15 minutes apart on the 24-hour dial.

Attic Fan—This is a Telechron Motored, precision built timer for 0 to 10-hour operation, accomplished by manual presetting. Equipped with fast action silver contact switch, and underwriter approved. The ideal attic fan control . . . made in the Paragon tradition of quality.

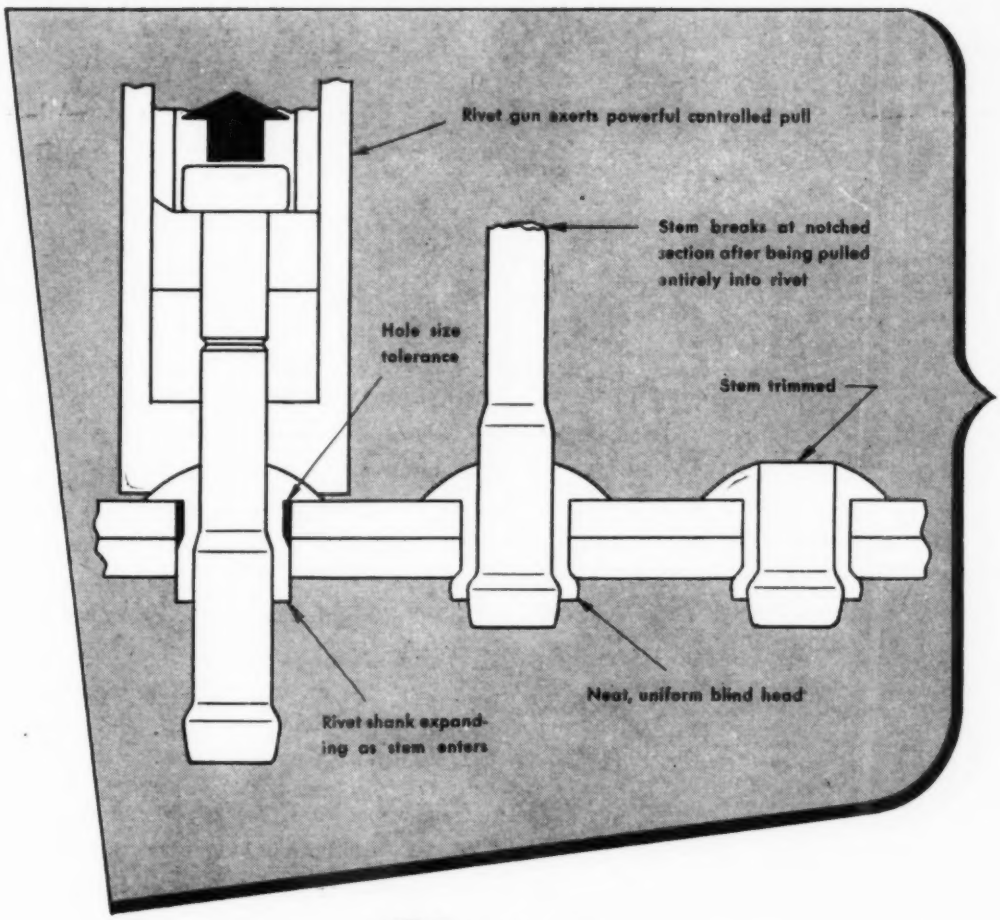


Series "J"—This series is known as Time Cycle Repeater Switches, designed primarily for stoker fire maintenance and heavy oil agitation. In this series are timers which provide time cycles from 1 minute to 4 hours.

The Paragon Electric Company makes a complete line of domestic, commercial and industrial time controls. Further data about the switches described above or any other switches in the line will be supplied on request. Look to Paragon as Time Control Headquarters. Forty-two years of time switch manufacturing experience. "If it's timed, Paragon can control it."

PARAGON ELECTRIC COMPANY
1608 TWELFTH STREET
TWO RIVERS,
WISCONSIN

Paragon *Two Rivers* WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905


Rivet gun exerts powerful controlled pull
Stem breaks at notched section after being pulled entirely into rivet
Hole size tolerance
Stem trimmed
Neat, uniform blind head
Rivet shank expanding as stem enters

DYNAMIC EXPANSION

of the rivet shank is the answer. Greater shank expansion than any other blind fastener. Powerful controlled pull of rivet gun draws stem into rivet shank, *forcibly expanding* rivet to fill hole *tightly*. Joint is strong, tight, permanent.

HOW *Strong* CAN A BLIND RIVET BE?
HOW *Tight* CAN A BLIND RIVET BE?

CHERRY BLIND RIVETING has stirred up enormous interest since its inception during the war. This remarkable new fastening technique is so *fast* and the results are so *uniformly positive* that it has spread from industry to industry at an astonishing rate. To those who are familiar with the basic characteristics and many possibilities of Cherry Blind Riveting, its virtues are implicit . . . but others, not yet having experienced its advantages, still wonder about certain basic questions. Strength and tightness, for example.

Tight, Strong Joints — There are three types of Cherry Blind Rivets. The *self-plugging type* is comparable in strength to solid rivets and is recommended for structural applications. The *pull-through hollow* type is for tight, rigid joints on non-structural jobs. The *regular hollow* is a tacking rivet that clinches very tightly.

Cherry Blind Rivets have (a) greater shank expansion and (b) greater allowable variance in material thickness . . . than any other blind fastener. This means uniformly tight, strong joints under actual shop conditions where hole sizes and sheet thicknesses cannot always be controlled closely.

High-strength, self-plugging type Cherry Blind Rivet.

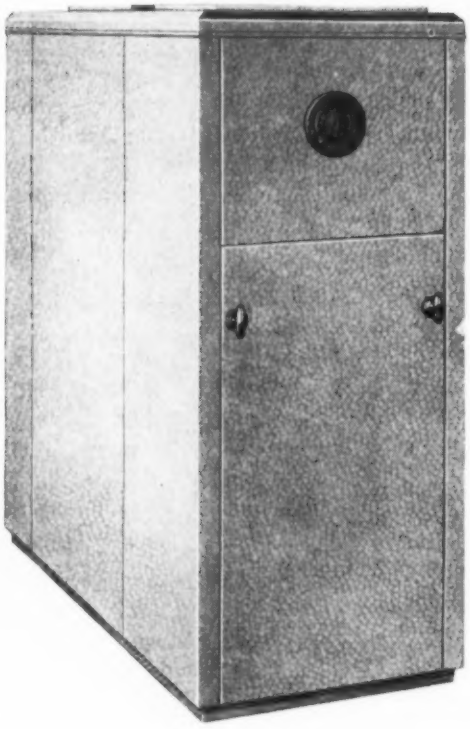
Tight-clinching, pull-through hollow type Cherry Blind Rivet.

CHERRY RIVETS: THEIR MANUFACTURE & APPLICATION ARE COVERED BY U. S. PATENTS ISSUED & PENDING

Cherry Rivet Company
LOS ANGELES 13, CALIFORNIA

Get this Illustrated Manual. Write to Dept. A-200, Cherry Rivet Company, 231 Winston Street, Los Angeles 13, Calif.

ROUND OAK



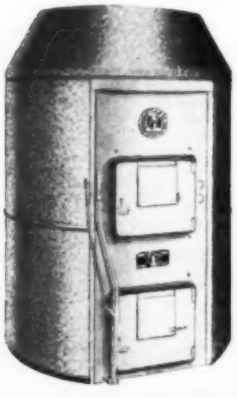
OFFERS A QUALITY, DEPENDABLE FURNACE LINE FOR REAL DEALER PROFITS!

Here's your chance to get on the profitable new-heating installation band wagon. Homeowners all over the nation need new furnaces badly. Most of them are trying to make ends meet with worn-out furnaces because they haven't been able to get new furnaces for quite a while. Get out your prospect list and drive home to each and every one the fact that Round Oak Warm Air Conditioning Units afford them all the benefits and pleasures of economical automatic heating plus the health and comfort of Circulated Warm Conditioned Air. They're anxious to buy and when you show them your new Round Oak line you'll really have to go some to keep abreast of the orders.

We've been in the business a long time. We know what homeowners want, and you can rest assured that Round Oak units will satisfy them. We're just as sure that our liberal dealer franchise will satisfy YOU . . . so why not investigate it today. We'll be glad to send you all the information . . . just drop us a postcard.

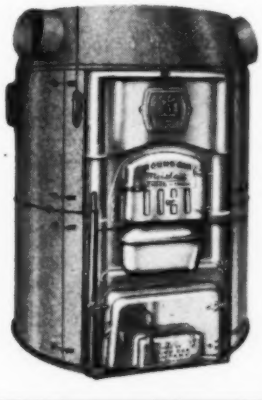
ROUND OAK Automatic OIL HEAT AIR CONDITIONER

A real seller for the modern post-war market. It's compactly designed and engineered to provide economical oil or gas heat. Outstanding in its quality construction are the Oil burner, flange mounted, especially designed for the furnace. It provides the ultimate in economy, smoothness and dependability. The steel welded jointless furnace provides long fire travel and radiating surface for maximum heating efficiency. It's beautiful blue Hammerloid finished cabinet will go well with the modern rumpus room . . . and inside you'll find efficient air cleaning filters and a snap-action humidifier to help provide heathful, clean, humidified air. For large homes, the XCL , average homes, the XCM and for small homes, the XCS. Investigate this superior unit NOW!



S-R SERIES STEEL FURNACE

A beauty for the small homes! Real value and efficiency in the body of extra-heavy copper bearing steel. Extra large heavy gauge, steel-baffled radiator for longer fire travel, Convenient clean-out, Double front with knock-out openings on either side for hot water coil, and heavy revolving type, dump center grates. The SR series is an investment that will pay big dividends to the homeowner on winter comfort, low heating costs, and exceptional maintenance economy.



MOISTAIR BLENDED-IRON "J" SERIES FURNACE

A heavy duty furnace built of Blended-Iron. Embodies modern, efficient items of construction such as the patented one-piece, diamond-shaped, adjustable radiator, two heavy, improved gravity clean-out doors, heavy durable 2-piece firepot ribbed inside and out with deep cup joints, rugged duplex grates, deep two-section firepot, and durable galvanized iron casing with air space liner.

ROUND OAK CORPORATION
DOWAGIAC, MICH.

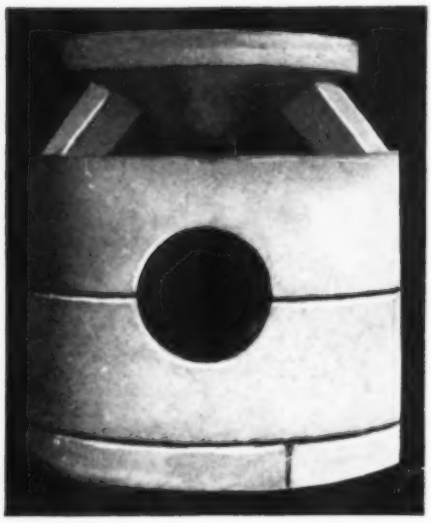
Instant
COMBUSTION
EFFICIENCY

Immediate
SAVINGS

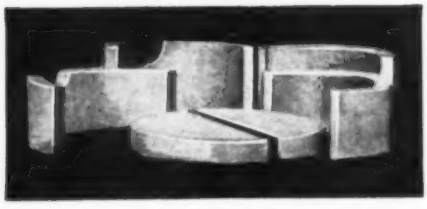
With

REX RoTo COMBUSTION CHAMBERS

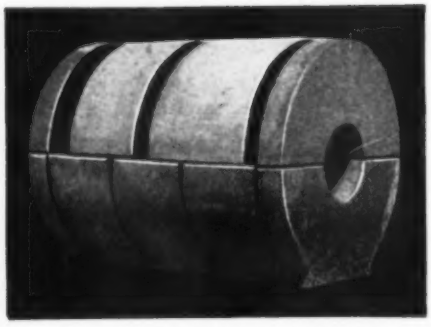
PATENTED



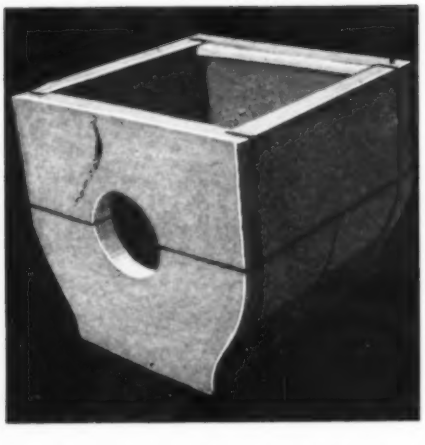
Rex Roto Vertical Combustion Chamber complete with Rex Roto Baffle installed.



Component parts which comprise the Rex Roto Vertical Combustion Chamber.



Rex Roto Horizontal-Baffled Combustion Chamber designed to distribute the heat from the oil burner evenly and efficiently throughout the length of the fire box.



Rex Roto Horizontal-Rectangular Combustion Chamber completely assembled.

REX RoTo

TRADE MARK

COMBUSTION CHAMBERS AND BAFFLES

Installed Easily and Quickly

in Any Style Furnace with Any Make Burner

•

HERE ARE A FEW OF THE REASONS WHY REX ROTO COMBUSTION CHAMBERS ARE SUPERIOR:

Quick Surface Temperatures:—Rex Roto Combustion Chambers arrive at a high surface temperature immediately. This means the complete burning of oil even at the start of burner operation.

Easily Installed:—Each section of a Rex Roto Combustion Chamber is made absolutely true in shape and size. They are easily set in place in a fraction of the time usually necessary with built-up chambers. Cement is not used, saving time and expense and permitting free expansion and contraction at all temperatures.

Insulating Base:—The base is made in two thick sections which serve as a floor insulator. As an integral part of the combustion chamber, it helps materially to stop heat loss through the floor.

Sizes to Meet Any Requirements:—Regardless of specified gallonage per hour, there is a Rex Roto Combustion Chamber built to meet your requirements.

Exceptionally Low In Cost:—The prices of Rex Roto Combustion Chambers are unbelievably low. Price lists are available on request.

Packed Complete and Ready For Installation:—Rex Roto Combustion Chambers are carefully packed in individual cartons complete and ready for installation.

No Cutting, Fitting or Waste Materials:—No other labor is necessary than to remove the sections of a Rex Roto Combustion Chamber from their carton and set them in place. There is no cutting, fitting or cementing required.

Fits All Gun or Pressure Type Burners:— The efficient, low cost features of Rex Roto Combustion Chambers are available with any oil burner installation, regardless of type or make.

•

REX INSULATING CEMENT FILL

•

DESCRIPTION

A blend of pre-shrunk insulating materials having higher insulating properties and fills greater space than any other known blended insulating fill having the proper amount of bonding materials.

•

ECONOMY

Very light in weight.

Packed in convenient sized shippers Shippers may be used for mixing container as minimum amount of water is required.

•

MORTAR

The addition of a small amount of Portland Cement will make an excellent mortar.

•

FOR FULL INFORMATION WRITE

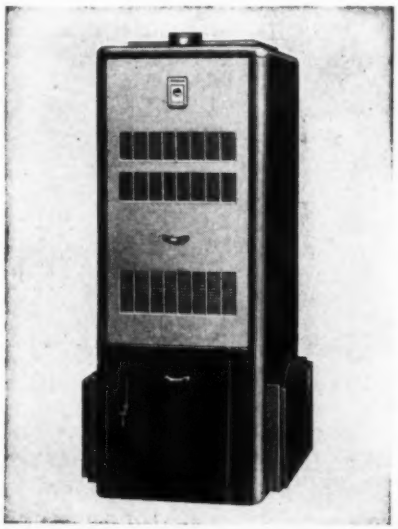
THE REX CLAY PRODUCTS CO.

14414 DEXTER BOULEVARD • DETROIT 6, MICHIGAN

You sell Years of Carefree Comfort

THE SHAWNEE, a gravity furnace for natural, mixed or liquefied petroleum gas, has a copper bearing steel heating element, and possesses design and construction features that insure efficient, dependable long-term service. Available in five sizes, ranging from 65,000 to 140,000 Btu input per hour.

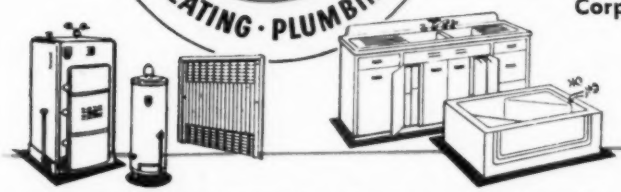
...with Maximum Fuel Economy



THE WYANDOTTE Automatic Winter Air Conditioner for natural, mixed or liquefied petroleum gas, is suitable for first floor or basement installation where space is at a premium. Has copper bearing steel heating element. Comes in five sizes—from 70,000 to 150,000 Btu input per hour.

When you sell the AMERICAN-Standard **SUNBEAM Line**

AMERICAN-Standard HEATING · PLUMBING



■ Sunbeam Warm Air Furnaces and Winter Air Conditioners by American-Standard are engineered to stand up . . . styled to stand out. Their efficient performance, operating economy and modern appearance insure lasting customer satisfaction. That's why they enjoy a public acceptance second to none. They're easy to handle because you deal with a single dependable source. Contact your Wholesale Distributor for full information, including details of a convenient Time Payment Plan for modernization business. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pa.

Serving the Nations' Health and Comfort

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.

MASTER
TEMPERATURE CONTROLS

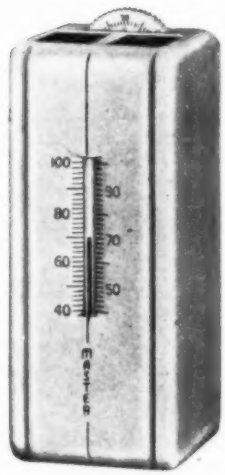
MASTER CONTROL MOTORS

Carefully designed, precision manufactured, Master Control Motors are the answer to the needs of users of control equipment. This motor is noted for its silent, powerful operation and low current consumption. If control motors are your problem, we are able to make them available now.

The "MASTER" Mark on Temperature Controls Means— Greater comfort . . . longer life . . . more efficient service for your customers . . . easier sales for you.

D-22A Regulator Switch

For over a quarter of a century, "White" has been a distinguished name in the heating industry. Master Temperature Controls are famous for their greater comfort, more efficient service and longer life . . . factors which insure complete satisfaction for your customers and growing sales for you.



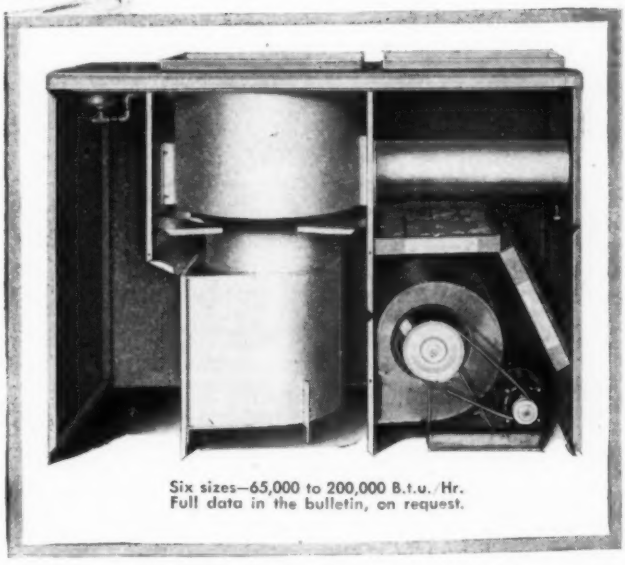
A-23 Plain Thermostat

Don't overlook WHITE . . . it's not only a name; it's a guarantee.

WHITE MANUFACTURING COMPANY

2368 University Ave. **St. Paul, Minnesota**

HERE'S WHAT I WANT IN HOME HEATING!



Six sizes—65,000 to 200,000 B.t.u./Hr.
Full data in the bulletin, on request.

I want plenty of good, warm, conditioned air with push enough behind it to shove it into every room—

He'll get it in a Fitzgibbons Directaire, with its powerful blower and streamlined air circulation.

I want a trouble-free humidifier, filtering system and no leaks—

The humidifier is so simple that it will work indefinitely without attention. The air filter is as easily removed and replaced as opening and closing a bureau drawer. Fitzgibbons "Weld-seal" construction assures permanent isolation of burner gases from the air stream.

I want quiet—not a lot of noise—

The blower motor in the Directaire is supported on rubber pads. The blower is balanced, and of ample size so that high speed is not needed, hence blower sound is minimized. The combustion chamber, too, is properly sized, cutting down combustion noise and resonance.

I want comfort, but I don't want to pay too high for it in fuel money—

Now you're talking! The special Fitzgibbons "Contra-Flo" circulation makes every thermal unit do its job before it gets to the flue. You get all the heat your fuel dollar will buy, in the Directaire.

Speaking of cost, I don't want to pay a gilt-edge price for my conditioner—

He won't, in a Directaire. It's precision-engineered for Fitzgibbons volume production, with close manufacturing tolerances so that everything clicks together the first time. Cuts cost and also makes a better unit.

I may want oil or gas firing—not sure which—

The Directaire is designed to work with any good oil or gas burner. And you can replace one with the other at any time should conditions require.

Summing up, I want a conditioner with a name and reputation behind it—not one whose manufacturer may be out of business in a year or two—

There are sixty-one years of successful manufacturing experience behind the Directaire. For all those years the name Fitzgibbons has meant economical heating comfort.

MEMBER
NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT

Fitzgibbons Boiler Company, Inc.

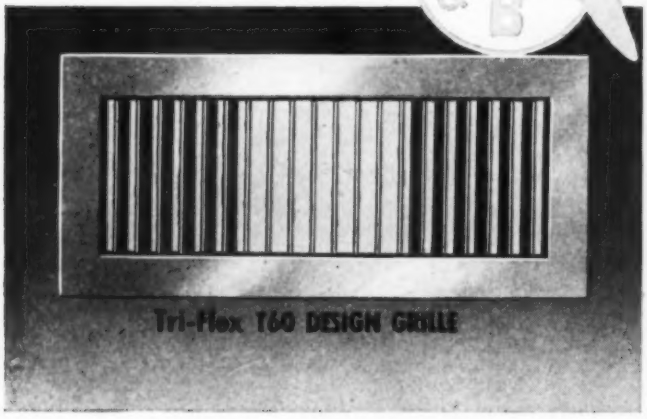
General Offices: 101 PARK AVENUE, NEW YORK 17, N. Y.
Manufactured at: OSWEGO, N. Y.
SALES BRANCHES IN PRINCIPAL CITIES

FITZGIBBONS DIRECTAIRE

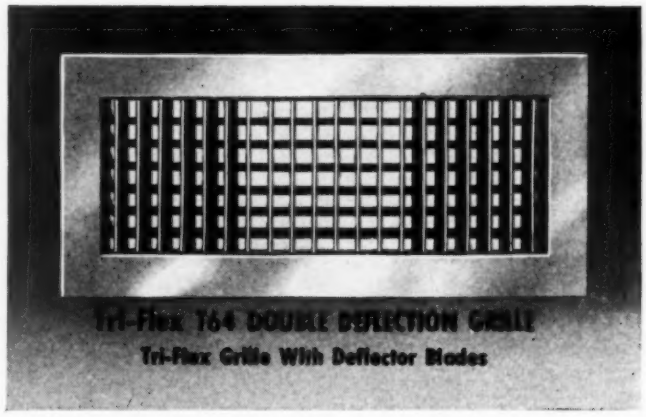
The warm air conditioner that meets all conditions

ANNOUNCING THE NEW....

Tri-Flex DESIGN



Tri-Flex T60 DESIGN GRILLE



Tri-Flex T64 DOUBLE DEFLECTION GRILLE
Tri-Flex Grille With Deflector Blades

Maximum Flexibility TO MEET ALL CONTROL REQUIREMENTS

Tri-Flex T62 MULTI-SHUTTER REGISTER
Tri-Flex Grille With Multi-Shutter Damper

Tri-Flex T642
DOUBLE DEFLECTION MULTI-SHUTTER REGISTER
Tri-Flex Grille With Deflector Blades And Multi-Shutter Damper

The new TRI-FLEX design is the result of many years of research and experience in the manufacture of air conditioning grilles and registers. It brings new beauty and new efficiency to the Tuttle & Bailey line . . . and the great advantage of standardization in manufacture that will help us to give even better service to those who use our equipment.

TRI-FLEX grilles and registers make possible really complete and efficient control of air delivery in three ways—control of direction, control of throw, and control of air drop, each of which is equally important if an air conditioning system is to function properly. The TRI-FLEX grilles and registers shown above are made up of various combinations of three flexible units, the grille with individually adjustable front bars, the individually adjustable horizontal deflector blades, and the "positive control" multi-shutter damper.

Specify the new Tuttle & Bailey TRI-FLEX line and you specify better engineered control of air distribution.

TUTTLE *and* BAILEY

NEW BRITAIN, *Connecticut*

ENGINEERED PRODUCTS MEAN BETTER AIR DISTRIBUTION

A NEW *General*

HEADS THE FAMOUS LINE OF *General* FUEL OIL FILTERS

READY TO HELP YOU INCREASE PROFITS!

DEMANDED BY CONTRACTORS

NOW!

SIMPLE INSTALLATION

A NEW SUPER ECONOMY MODEL

PRACTICAL ALL PURPOSE FILTER

A SURE MONEY-MAKER!

SEE YOUR JOBBER!

See Our Exhibit
at the
INTERNATIONAL HEATING AND VENTILATING EXPOSITION
Lakeside Hall
Cleveland, Ohio
January 27-31, 1947
BOOTH No. 916

Announcing this new leader for the *General* line of fuel oil filters means another big opportunity for increasing your profit possibilities and adding to your service dollar volume. This size filter has been in demand for a long time by contractors, jobbers and fuel oil service companies. We are happy to announce *General* Master Model 2A-700 in time to help make 1947 a banner year!

The new *General* Master Model 2A-700 is a new advance in superfine filtration. It not only removes all waxes and gums but absorbs all solids regardless of microscopic size. It will serve efficiently on any size heating plant using No. 1, 2 or 3 fuel oil. Its large one-quart capacity assures long life. Single-bolt construction requires no special tools for cartridge replacement.

With the *General* line you are building good will through giving customers clean-burning, trouble-free operation. For your part you eliminate costly call-backs. You make a handsome profit on every installation. You are assured an easy service charge on each periodic cartridge replacement. It's good business to work with *General*! See your jobber, or write direct, for details and prices.

GENERAL FILTERS INCORPORATED **GENERAL FUEL OIL FILTER** **12890 WESTWOOD AVE. DETROIT 23, MICHIGAN**

CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, 1227 ST. CLAIR • TORONTO, ONTARIO

FACTORY REPRESENTATIVES: William J. Debler & Sons, Phila., Pa. and Brookline, Mass. . . . V. B. Kathe, Vancouver, Wash. . . . Western Sales Company, San Francisco, Calif. . . . W. V. Nuttall Company, Salt Lake City, Utah . . . E. R. Pauline & Son, Des Moines, Iowa . . . L. E. Schulein Company, Chicago, Illinois . . . Geo. H. & F. Wm. Granse, St. Paul, Minn. . . . Richard Barthelmess Sales Company, Jacksonville, Fla.

Announcement of Special Interest

To Manufacturers of Original Equipment

Requiring BLOWER ASSEMBLIES

☆ *Just Off the Press*

Now Authoritative Catalogues covering Blower Wheel Engineering, Blower Wheel Assembly Manufacture, Engineering Drawings, Charts and Curves.

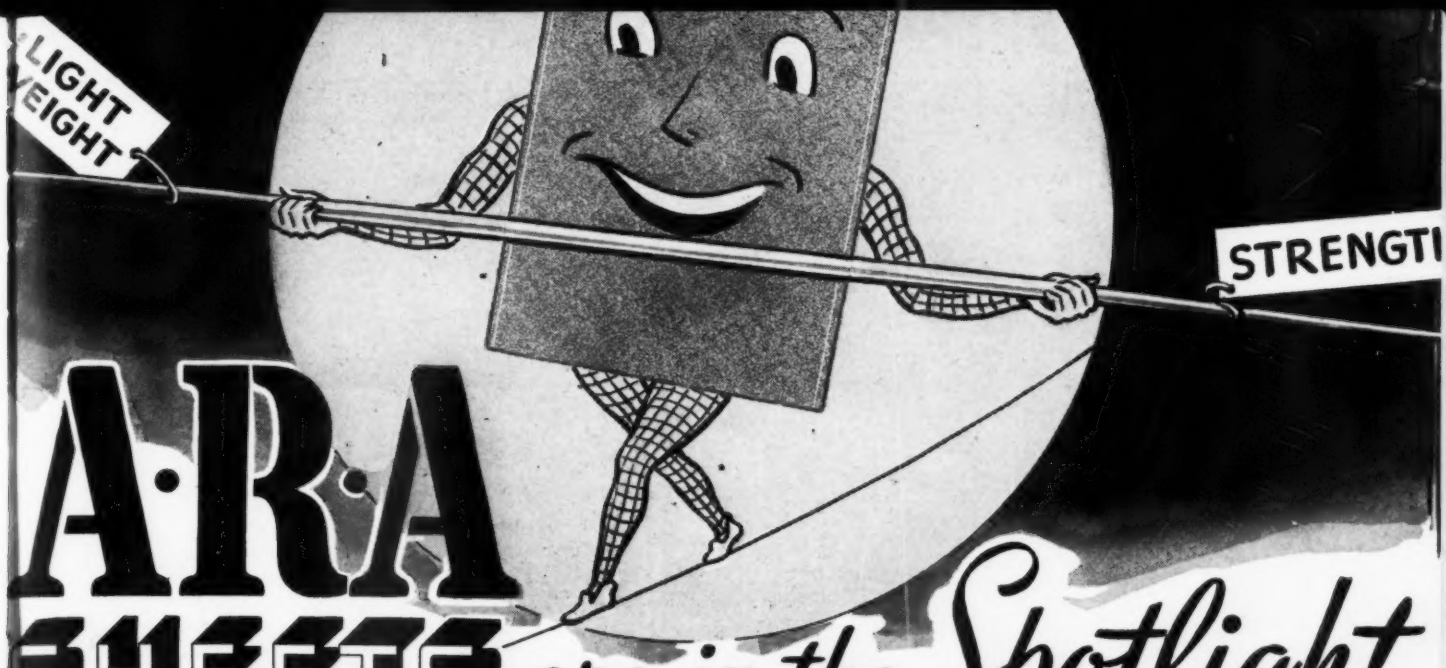
Ask for your Copy

Bulletin No. 303 Morrison Airstream Engineering Service.
Bulletin No. 403 Morrison Airstream Blower Wheels.

SEE THE Morrison Exhibit, Booth 748, January 27-31, at the 7th International Heating and Ventilating Exposition, Lakeside Hall, Cleveland.

MORRISON PRODUCTS, INC.
East 168th Street and Waterloo Road
CLEVELAND 10, OHIO

MORRISON Airstream
PATENTED



A·R·A SHEETS are in the Spotlight

DUCTS

You can cut A.R.A. Sheets into panels and fabricate them into duct work by using scrap metal for the corners and joints. The metal pieces can be attached to the A.R.A. Sheets with ordinary sheet metal screws.

. . . . because they are doing a difficult job SUCCESSFULLY. Used in place of sheet steel, A. R. A. sheets must possess many unusual characteristics—and they do.

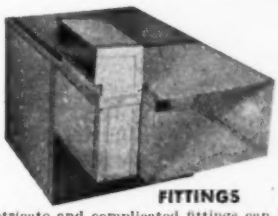
These remarkable sheets have a happy balance of strength and light weight. A. R. A. sheets are 33″ x 48″ and weigh about 5 pounds. Each sheet passes a Mullen Test (bursting) of over 200 pounds per square inch.

This is why A. R. A. Sheets are easy to handle, cut and fabricate, and still are very strong—strong enough to withstand rough handling in transit, in stock and on the job.

In the Heating and Ventilating field, Popular Approval and Demand are keeping A. R. A. Sheets in the Spotlight.

FITTINGS

Right in your own shop and with your own tools you can completely fabricate A.R.A. Sheets into fittings using no sheet metal.



FITTINGS

Intricate and complicated fittings can be easily fabricated in your own shop using a minimum of metal. A.R.A. Sheets can be die cut or notched, creased, scored and bent.

ROUND PIPE

You can roll A.R.A. Sheets on your own rollers into smooth, strong, round pipe. A standard metal seam can be used for the long joint and a sleeve of A.R.A. Sheets or metal can be used for the butt joints.

A.R.A. SHEETS ARE A FULL AND UNLIMITED SUBSTITUTE FOR SHEET METAL

Asbestos clad A. R. A. sheets are tough yet flexible—rigid but not brittle—fire-proofed and water-proofed—will not dry out, crack, crumble, or chip, have a high insulating value (K, 45 B. T. U.) and good sound-deadening properties. They are easy to handle, will bend without breaking and can be rolled, punched, scored and die cut, still retaining their rigidity and strength.

DUCTS

By "setting" your brake to allow for the 3/16″ thickness of A.R.A. Sheets you can fold or bend at right angles to form small one-piece ducts or stacks. A preformed metal seam may be used for the long joint or the butt joints.

THE PACKAGE

A.R.A. Sheets are shipped in an easy-to-handle carton weighing about 100 lbs. There are 20 Sheets 33″ wide x 48″ packed to a carton.

Write for our free 16-page booklet No. 89A. Gives full information on A-R-A Sheets. Gladly sent on request.

Extremely heavy demand makes necessary that orders be placed well in advance.

Get Genuine A. R. A. sheets from your jobber

GRANT WILSON, INC.

141 WEST JACKSON BLVD. AT LA SALLE ST., . . CHICAGO 4, ILL.
(22nd Floor, Board of Trade Bldg. . . Phone: Wabash 8220)

NOTICE

A group of business men is meeting regularly to consider important problems in this industry. The meetings are addressed by well known speakers and subjects of current interest are discussed. Paid admission. Companies serving this field are invited to send representatives to describe their products and services.

Such a notice might well describe the issues of this publication.

Advertisers . . . get the facts about this audience

EVERY issue of this publication reaches an influential audience which welcomes news and information about products or services for their business. In these pages you are offered an opportunity to talk to this audience.

If you were going to pay for the privilege of actually talking to an audience about your business, you would want to know all about it. How many people? What is their occupation and business? Where are they from? How much did they pay to get in? Will it pay you to talk to them?

The answer to these and many other questions would decide the value of the audience to your business.

A. B. C. PROTECTS YOUR ADVERTISING

Paid subscriptions, renewals, evidence of reader interest, are among many facts in A. B. C. reports that are definite guides to effective media selection. When you buy space in A. B. C. publications your advertising is safeguarded by audited circulation. Always ask for A. B. C. reports.

From an investment standpoint it is just as important that you should know *all* about the people who will see your sales message when you advertise in this or any other business paper.

In order to select the right media, with the assurance that you get what you pay for and that your audience will be receptive to the particular message that you have to tell, base your selection on the verified information to be found in A.B.C. reports.

That is why we belong to the Audit Bureau of Circulations—to give advertisers audited facts and figures about the audience they will talk to when they advertise in these pages.

AMERICAN ARTISAN

Member of the Audit Bureau of Circulations ABC *Ask for a copy of our latest A.B.C. report*

A. B. C. = AUDIT BUREAU OF CIRCULATIONS = FACTS AS A MEASURE OF CIRCULATION VALUES

ALLEN Here's Your Directory of Quality Sodering Supplies

ALLEN SPECIAL STAINLESS STEEL SODERING FLUX

(Item 605)

Here's a remarkable, fast flux that makes the sodering of stainless steel as easy as sodering tin plate. (Also available in a special odorless formula where less strength is required). "ALL - SOL" works with all soders but for best results use **Allen** stainless steel soder. Pints, gallons.

ALLEN SODERING SALTS

(Item 1-01)

An all around flux in convenient powder form; just add water 3 to 5 times according to metal to be sodered. Soders all metals but aluminum. Takes a quick bite and makes the soder hold on. Non acid. Comes packed in metal or glass as preferred. ½ lb., 1 lb., 5 lb. sizes.

ALLEN ALL-METAL SCRATCH BRUSHES

(Item 16-13)

A remarkable brush for speedily removing rust, corrosion, brightening metal. Brush is all metal, hence can be used under torch flame, etc. Brush can be cut off at end, thus renewing life as front end wears down. Bristles of tough, strong steel. Three brushes like illustration. Also one all metal brush, "straight-construction" for battery work, etc. Large medium and small sizes.

ALLEN SODERING OIL

(Item 4-04)

A highly technical, concentrated sodering compound officially endorsed by the National Underwriters.

Causes neither verdigris nor corrosion. Gets into the tiniest crevice and takes the soder along with it. Makes perfect electrical and mechanical joints. For hand or machine sodering. Excellent for sweat sodering copper pipe joints. 1 lb., 3 lb., and 12 lb. sizes.

ALLEN Neutral Rosin Fluid Flux

(Item 0-08)

This is a flux of absolute safety for electric motors, telephones, radio, commutators, instrument work, fine wires, etc. This flux is so safe you can spill the flux on the work allowing it to remain forever with no corrosion hazard to the finest wire or metals. Allen Neutral Rosin Fluid Flux is absolutely neutral and moisture free and absolutely non-conductive to electrical current. Quarts and gallons.

ALLEN Galvanized SODERING ACID

(Item 9-07)
(Formula G. I.)

An active sodering acid for galvanized and hard-to-soder metals and old metal that has been exposed to the weather. Works well on monel metal (white label shipping regulations). Quarts & gallons.

Note: For "all-a-round" sodering on new and fairly clean work use **Allen** Sodering Liquid (see No. 6 above.)

Note: For sensitive electrical sodering see No. 8 directly below.

ALLEN ALUMINUM SODER

(Item 22-18)

Allen Alumi-Soder is a complete soder and flux combined. Requires only heat to permanently join aluminum to itself or other metals. Comes in ⅛" square wire form and triangular ¼ lb. and 1 lb. bars. Also in popular trial size pieces, called 9 inches pieces. ¼ lb. and 1" bar and wire form.

Also soders cast-iron

ALLEN SUPERTITE ACID SWABS

(Item 15-12)

Deep set bristles of good quality held tightly in heavy gauge holder; securely crimped, no jagged edges or rough metal exposed. No. 2 and No. 1 sizes.

ALLEN SODERING LIQUID

(Item 8-06)

Standard Formula. For all-a-round work, for all metals save aluminum and stainless steel.

17,000 pounds to the square inch with no gumming, fumes, or corrosion. Double strength, non-evaporating. Works like Lightning. Adaptable to hand, or machine sodering. Excellent for tinning the sodering copper. 2 oz., 4 oz., quarts and gallons.

ALLEN EZY-FLO Torch Formula Sodering Paste

(Item 2-A)

A special sodering paste for torch and "sweat joint" sodering. Also works well with the sodering iron. Comes in same sizes and at same prices as "Standard Formula," 2, 4, 8, 16 oz.

ALLEN SODERING PASTE

(Item 2-02)

Standard Formula, Safest sodering paste made — fast working—a convenient corrosion-free, soft form of flux. Adheres to the surface while you soder. Assures secure electrical and mechanical joints. Saves time. Triples strength of the soder. Makes soder self-fluxing. Official National Underwriters Laboratory approved listing. 2, 4, 8, 16 oz.

SILVER SODER

WIRE AND RIBBON FORM
(Item 20-15)

Wire form for all around work. Excellent tensile strength, high vibration and corrosion resistance. Gives rigid, good color joint.

Ribbon form same specifications as wire. (For band saw **Wire Form** work.)

FLUX FOR SILVER SODER

(Item 3)

Provides quick, smooth flow giving deep sound silver soder penetration on most metals including stainless steel. 1 lb. and 5 lb. sizes.

At Your Service

ALLEN

Sodering Research Division

. . . maintained for the testing, development and perfection of Allen products and to help solve our customers' technical problems. If you have a sodering, tinning or related problem we shall be glad to co-operate. There is no charge for this service.

The following Allen Technical Bulletins are available without charge.

- **A)** Strength of Soder (Resistance to vibration).
- **B)** Breaking strength of Wire Soder (Shows tin-lead proportions).
- **C)** Length of one pound of Wire Soder in various sizes and alloys.
- **D)** How to Soder Stainless Steel Pipe and Fittings.

FREE OFFER!

MAIL THIS NOW!

L. B. ALLEN CO., INC.
6702 Bryn Mawr Avenue
Chicago 31, Illinois

Send us FREE Allen Technical Bulletins listed above. Check those desired: A — B — C — D

Without obligation send us further information on the product items checked here. Nos. 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10 — 11.

NAME .....

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L. B. ALLEN CO., Inc.
6702 Bryn Mawr Ave., Chicago, 31, Ill.

ALLEN REG. U.S. PAT. OFF.

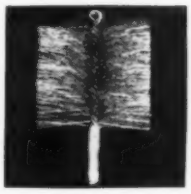
Schaefer BRUSHES

"BUY SCHAEFER ---- IT'S SAFER"

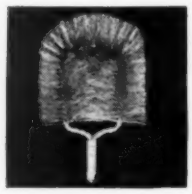
Performance tested, SCHAEFER Brushes offer longer wear, better service, greater value—with the *correct* brush for every industrial and domestic use.

SCHAEFER Flue and Boiler Brushes of SILVER BRITE Rust-proof Wire

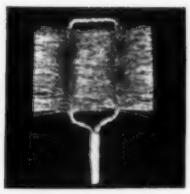
SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.



SCHAEFER
Rectangular Flue Brushes
No. S-415—2"x4"x4½"
No. S-416—3"x5"x4½"



SCHAEFER
Boiler Brushes
No. S-393—1¾"x4"x5½"
No. S-394—2⅛"x6"x6½"
No. S-395—3½"x6"x6½"

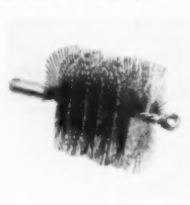


SCHAEFER
Boiler Brushes
No. S-390—1⅝"x4"x4½"
No. S-391—2½"x6"x4½"
No. S-392—3½"x6⅝" x4½"

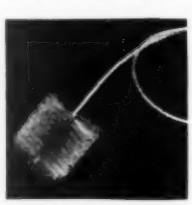
SCHAEFER
Boiler Brushes
No. S-399—2"x4"x6"
No. S-400—2½"x4½"x6"
No. S-401—3"x5"x6"

Single and Double Spiral Flue Brushes
No. S-432—Single Spiral —1" to 4" dia.
No. S-433—Double Spiral —1" to 4" dia.
No. S-434—For small Flues — 1" to 1" dia.

SCHAEFER Round Flue Brushes of Single Spiral, Flat Steel Wire
No. S-430—1" to 4" dia.

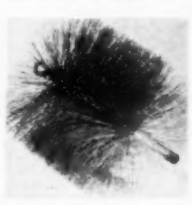


SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral
No. S-420—2"x3¼"x4"
No. S-425—2¾"x6¾"x7"

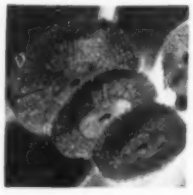


SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel
No. S-442—3", 4", 4½", 5" with 5 ft. handle.

SCHAEFER
Fibre Furnace Brushes
Selected Bassine fibre, flexible wire stem. 4", 5", 6" dia., 48" and 60" handle.
No. S-444-445



SCHAEFER Chimney Cleaning Brushes
No. 66—6", 7", 8", 10" and 12" dia. round style of Black Tempered Brush Wire.
No. 666—6", 7", 8", 10" and 12" dia. oblong style of Flat Tempered Steel Wire.



SCHAEFER
Wire Wheel Brushes
Solid Center Type of crimped steel wire.
No. 276—6" dia. x 1⅝" face.
No. 278—8" dia. x 1⅝" face.
No. 280—10" dia. x 2" face.

SCHAEFER
Handy Wire Brush
No. 816 — For roughing, soldering, etc. 6" long, tempered steel wire trimmed 1½".

Tin Handle Acid or Dope Brushes
Selected grade bristles in tin ferrule. Widths, ⅜", ½", ⅝".

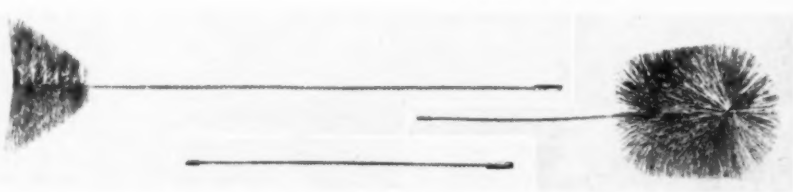
T. W. Flat Acid Brushes
Tinners soldering brush, horsehair filling. 1¼" width, 7½" overall. Twisted wire handle.

Radiator or Condenser Tube Brushes
Twisted in wire handle, selected hair or bristle. Wide range of sizes.
No. 10—⅝" dia. x 2" brush x 6½" overall.
No. 11—½" dia. x 3" brush x 8½" overall.

SCHAEFER Curved Handle Wire Brushes
No. 810 — Oil tempered steel wire, trimmed 1¼", hardwood block, 14" long. Brush 6", 2, 3, or 4 rows.

SCHAEFER Shoe Handle Wire Brushes
No. 812 — Oil tempered rustproof wire. 5" brush. 2, 3, 4 rows. Trim 1¼", overall 10".

SCHAEFER Straight Back Wire Brushes
No. 800-11—Oil tempered steel wire. Hardwood block, 7½" x 2¼". Wire trim, 1⅝", 6 x 19 rows.



SCHAEFER Vacuum Cleaner Brushes
No. 1005—Bassine Fibre Brush, 10½" dia. tapered to 3" dia. x 6 ft. long—48" handle with threaded nipple at end.
No. 1030—Bassine Fibre Brush, 10½" dia. brush x 10" long. Handle 39" with threaded nipple at end.

Wire Flue Brush and Extension Handles
4 ft. Handles with Nipple and Coupling.
5 ft. Handles with Nipple and Coupling.
6 ft. Handles with Nipple and Coupling.

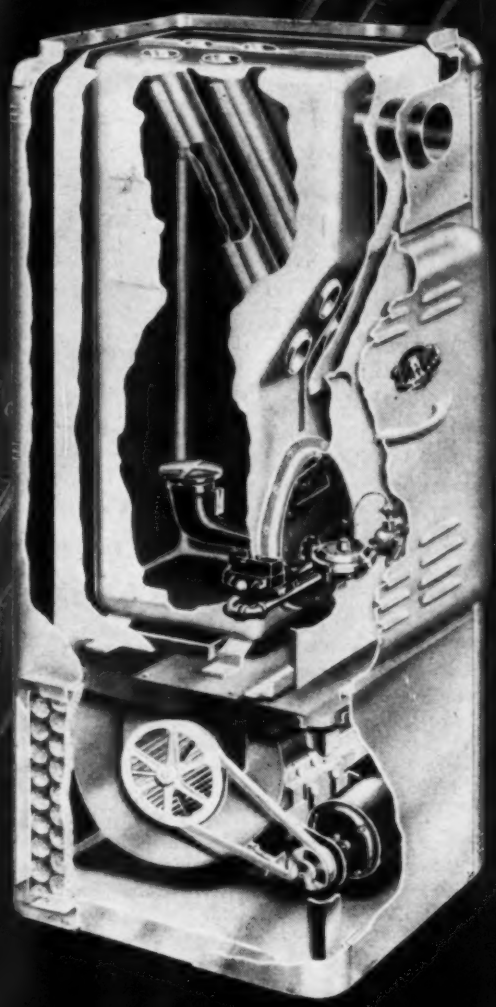
Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

SCHAEFER BRUSH MFG. CO.
1025 South Second Street Milwaukee 4, Wisconsin

WEATHER PROPHETS

* Pronounced "Profits" as in a MOR-SUN Dealer Franchise!

The "inside story" of the MOR-SUN pressed steel furnace is the foundation of a mutually profitable manufacturer-dealer relationship, resulting from MOR-SUN engineering. This new line of winter air-conditioning furnaces is easier to install and easier to service! And, stimulated by an intensive national advertising campaign to consumers, builders and architects, MOR-SUN is easier to sell! Remember, there are more profits in MOR-SUN!



MOR-SUN UTILITY MODELS
Above: U-4-0 for OIL
Left: U-4-G for GAS

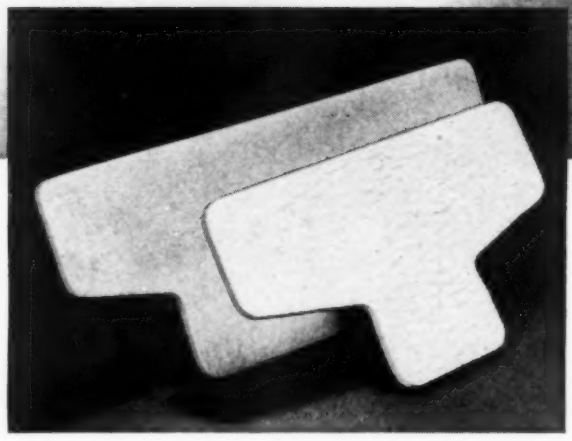
* See what's new in warm-air furnaces at our booth at the International Heating & Ventilating Show in Cleveland - Jan. 27-31.

MORRISON STEEL PRODUCTS, Inc., BUFFALO 7, N. Y.

"...and the plans include a *Skuttle Automatic Humidifier!*"

IT'S not the heat; it's the *lack* of proper humidity that makes so many winter homes "feel" downright dry and uncomfortable. That's why *Skuttle Automatic Humidifiers* are being specified as an important integral part of the regular furnace equipment in more and more of today's new homes as well as in many existing and replacement installations. Readily adaptable to all types of furnaces, these efficient, self-servicing units completely eliminate the objectionable "dryness" common to artificial heat by moisture-conditioning the air to the proper relative humidity for cleaner, healthier, more comfortable living.

They're well-built, too, for a long and useful life . . . with a pure brass and copper water tank and valve assembly, drawn steel vitreous enamel pan in 12″ to 28″ sizes, adjustable collar to fit either sloping or vertical bonnets, and large inspection door and frame. *Write today for full details!*



Replaceable VAPOGLAS* *Evaporating Plates!*

Skuttle's new VAPOGLAS is a revolutionary development in the home humidification field. More efficient, more durable, more economical, replaceable VAPOGLAS evaporating plates hold almost 70% more water than the ordinary brick ceramics, yet they're 60% thinner and offer proportionately less resistance to air flow across them. Made of 100% pure glass by a special process and die cut to exact uniform shape.

*Exclusive Trademark Registered U.S. Pat. Off.

More Sales Ahead . . . for Clean, Comfortable **HUMIDIFIED AIR!**

Skuttle Mfg. Co.

4099 BEAUFAIT • DETROIT 7, MICH.

CHECK THE FACTS and you'll find . . .

OIL-O-MATIC

LEADS IN

SERVICE TRAINING

Realizing that there were not enough service men to install and service all the oil heating equipment on order from an oil heat hungry public . . . and realizing that the future of the oil heating business depends on installations so satisfactory that they keep oil heating sold . . . Oil-O-Matic did something about it.

Over a year ago, Oil-O-Matic created the most advanced factory-operated service training school the industry has ever known. One thousand of our graduates yearly are returning to Oil-O-Matic dealerships from coast to coast, eager and trained to help build up and hold the public confidence and prestige the name Oil-O-Matic gives a dealer's store.

Every graduate is educated in the construction and operation of *all types* of automatic heating equipment. Each knows, through practice on "live" installations, the right way to install burners, boilers, and winter air conditioners, and to detect and correct trouble. This is the kind of thinking ahead which has made and will keep Oil-O-Matic the leader in the industry.

In addition, Oil-O-Matic leads in . . .

DESIGN—Because it is designed to operate on the famous Low Pressure Principle, wherein air and oil are mixed *inside* the burner, Oil-O-Matic handles *any* fuel oil without clogging—gives unequalled efficiency, economy, and dependability.

ENGINEERING—"Engineering against engineering!" That is Oil-O-Matic's policy. It means designing an oil burner that is better than any other burner—not just better than hand firing. To carry out this policy still further, Oil-O-Matic has greatly expanded its Engineering and Research Division.

MANUFACTURING—The manufacturing facilities and know-how that made Oil-O-Matic the leader . . that resulted in a $20,000,000-a-year war production rate . . . are now devoted to a still greater volume of precision-built peacetime products.

MERCHANDISING—Over $5,000,000 already spent in advertising and promotion has made Oil-O-Matic *first* in sales and *first* in public choice. Powerful magazine and newspaper ads, plus dealer helps, are daily selling more Oil-O-Matics—and *keeping them sold!*

WILLIAMS
OIL-O-MATIC
HEATING SYSTEMS

WILLIAMS OIL-O-MATIC DIVISION, Eureka Williams Corporation, BLOOMINGTON, ILLINOIS

"In the *FIRST* place . . .

Northwestern"

Of course, and why not? We have a reputation to uphold in this field . . . dealers all over the nation know that they can save themselves a lot of time and misery in locating hard-to-get parts by calling Northwestern FIRST. We've been in the game for years and locating scarce parts for customers has become second nature to us. Sometimes, of course, it takes a lot of scratching around, but we've a staff trained to do just that . . . and if they can't find the part you need, then it's just non-existent.

In the meantime . . . it'll probably be awhile yet before new material is available in the quantities needed, so we suggest you keep right after the lucrative furnace repair field. You're doing your customers and yourselves a favor by keeping the old heating plants operating as efficiently as possible until such time as new equipment becomes available.

So, for the present remember, "In the first place . . . Northwestern" . . . and save yourself time, trouble, and money. If you have any problems now, why not drop us a line?

Northwestern

STOVE REPAIR CO.

662 West Roosevelt Road — Chicago 7, Illinois

FASTEST GROWING COMPANY IN THE AUTOMATIC FIRING FIELD

Stok-A-Fire Co.

EXPANDS

INTO COMPLETE COVERAGE OF THE AUTOMATIC FIRING FIELD—

GAS • OIL • COAL

and changes its name to

Automatic Firing Corporation

Gas-A-Fire PRODUCTS

Oil-A-Fire PRODUCTS

Stok-A-Fire PRODUCTS

PARTNERS IN PROGRESS! Our present franchise holders have seen an initial franchise magnify in value and in profit. Again Expansion has its way as *Automatic Firing Corporation* starts the manufacture of "complete line" firing equipment for *every* home. Dealers share this added growth and profit. Each franchise now will cover the entire field, presenting the consumer with products fitted to his need in Gas, in Coal, in Oil. *We still have room for more dealers.*

Automatic Firing Corporation

FORMERLY *Stok-A-Fire Co.*

6504 OLIVE BLVD. • ST. LOUIS 5, MO.

Write for Franchise TODAY

Without obligating me in any way please send me full information on New Complete *Automatic Firing Corporation* franchise.

Name_____

Address_____

City_____ Zone____ State_____

CHICAGO HEAT MASTER COMPANY

Look to

HEAT-MASTER

FOR A COMPLETE LINE OF

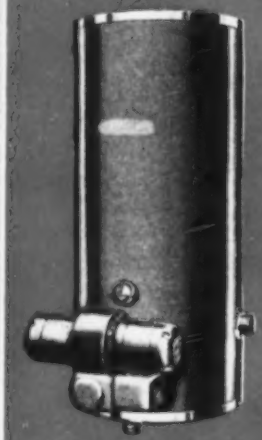
HOME EQUIPMENT

COAL

Furnaces, Stokers,
Hot Water Heaters.

OIL

Conversion Units,
Hot Water Boilers,
Warm Air Furnaces,
Water Heaters.



GAS

Conversion Burners,
Hot Water Boilers,
Water Heaters,
Warm Air Furnaces.

A complete line of quality merchandise developed for us by well known manufacturers who have streamlined their designs and their production with post war vision, to meet today's demands for better equipment for the home.

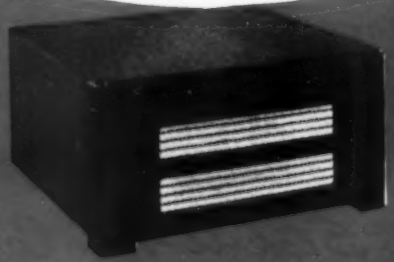
AUTOMATIC HEATING
VENTILATING
AIR CONDITIONING

Chicago HEAT-MASTER Company
506 So. Wabash Ave.
Chicago 5, Illinois

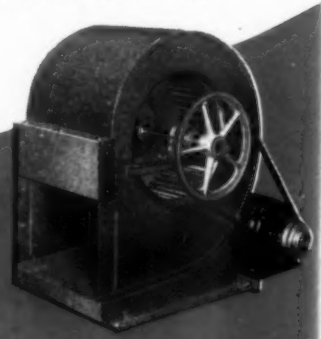
Package Home Heating Units for Coal, Oil or Gas

REFRIGERATION

Home and Commercial
Freezers.



RADIO



ELECTRIC

Furnace Blowers,
Ventilating Fans.

FRANCHISES AVAILABLE

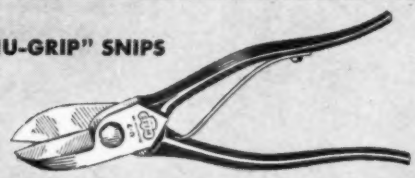
We have valuable Franchises available to a select few Wholesalers and Retailers who are qualified to handle this complete quality line of HOME EQUIPMENT.

WRITE TODAY

Heat-Master Home Equipment for Better Livin

J. WISS & SONS COMPANY — NEWARK 7, NEW JERSEY

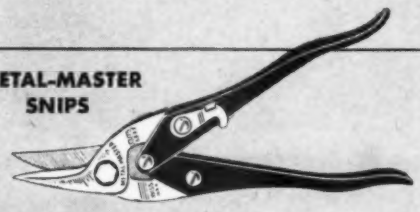
"NU-GRIP" SNIPS



Regular pattern for straight cutting on metal. Furnished with or without spring. Finest and fastest tool of its size for this work.

NO.	LENGTH	WEIGHT EACH
U7½	7½ in.	9 oz.

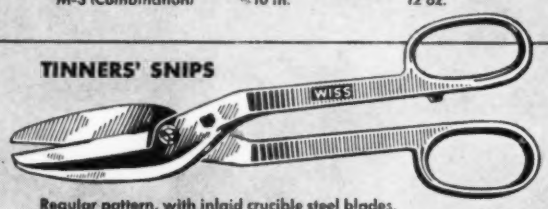
METAL-MASTER SNIPS



Compound action, metal cutting snips for the most intricate cutting up to 18 gauge. Rubber guard grips, extra, on request. Boxed individually.

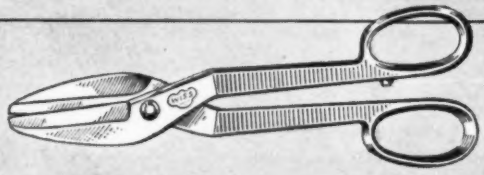
NO.	LENGTH	WEIGHT EACH
M-1 (cuts Left)	10 in.	12 oz.
M-2 (cuts Right)	10 in.	12 oz.
M-3 (Combination)	10 in.	12 oz.

TINNERS' SNIPS



Regular pattern, with inlaid crucible steel blades, gun metal finish handles. Individually Boxed.

NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
11	9½ in.	2¼ in.	¾ lb.
10	11½ in.	2½ in.	1½ lbs.
9	12½ in.	3 in.	2 lbs.
8	13¾ in.	3½ in.	2½ lbs.
7	14½ in.	4 in.	3 lbs.



COMBINATION PATTERN TINNERS' SNIPS

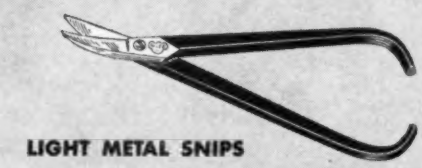
For curved or straight cutting. Inlaid crucible steel blades. Boxed individually.

NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
19	12½ in.	3 in.	1⅞ lbs.
18	13½ in.	3½ in.	2⅛ lbs.

CURVED BLADE TINNERS' SNIPS

Inlaid crucible steel blades, perfectly tempered and ground. Boxed individually.

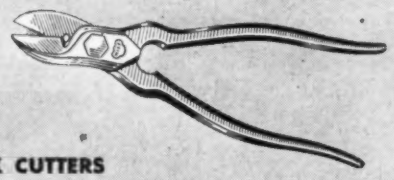
NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
9 C.B.	12½ in.	3 in.	2 lbs.



LIGHT METAL SNIPS

With curved or straight blades for light metal work. Made of fine tool steel. Packed 6 in a Box.

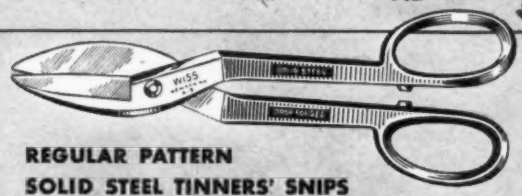
NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
J-7 Straight	7 in.	1¼ in.	4 oz.
J-7 Curved	7 in.	1¼ in.	4 oz.



B-X CUTTERS

Specially designed for B-X and armored cable, has many other uses. Has cutting edges, insulation crusher, scraper edge, circular form for crimping. With or without notch. 12 in a Box.

NO.	LENGTH OVERALL	AVERAGE WEIGHT EACH
B-X-1	7 in.	6 oz.



REGULAR PATTERN SOLID STEEL TINNERS' SNIPS

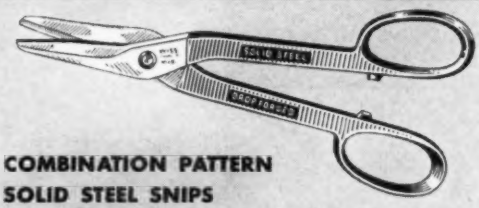
For straight cutting. Made of solid steel, gray enamel handles. Packed 6 in a Box.

NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
A-12	8 in.	2 in.	8 oz.
A-11	9¾ in.	2¼ in.	14 oz.
A-10	11 in.	2½ in.	1¼ lbs.
A- 9	12¼ in.	3 in.	1 lb. 10 oz.

COMBINATION PATTERN SOLID STEEL SNIPS

Handy pocket size, made of solid steel, gray handles. Cuts curves and irregular shapes easily. Packed 6 in a Box.

NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
V-13	7 in.	1⅝ in.	6 oz.



COMBINATION PATTERN SOLID STEEL SNIPS

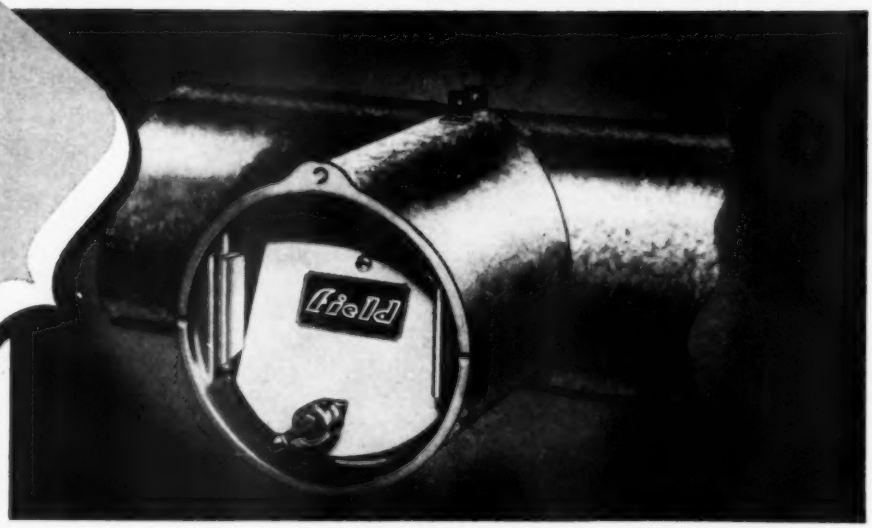
For curved and straight cutting. Solid steel, with gray handles. Accurately tempered jaws and strong bolts. Packed 6 in a Box.

NO.	FULL LENGTH	LENGTH OF CUT	AVERAGE WEIGHT EACH
V-19	13 in.	3 in.	1¾ lbs.

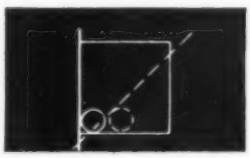
Not now available in all sizes, and all sold subject to quota and unavoidable shipping delays.

ON THE FINEST HEATING EQUIPMENT

DRAFT IS CONTROLLED by field



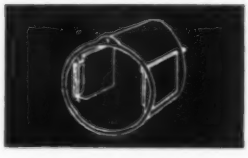
The famous field design



ROLLING TYPE HINGE PIN
— means no friction, no binding, no need for oiling, no fear of corrosion. Note the off-center gate mounting.

EXTENDED HOUSING
— places gate outside the flow of fouling soot and gases — no warping, no binding.

SIDE WINGS
— mean greater accuracy throughout the full range of the control. Fuel savings range up to 25%!



● **Because so much depends on proper control of drafts, leading heating equipment manufacturers are selecting the Field Barometric Draft Control as standard equipment. And alert dealers are installing Field Controls in all hand-fired furnaces in their territories. The installation is highly profitable, and provides a "door opener" for future sales of automatic heating equipment. Write today for facts on the Field line — most efficient, most accurate, most reliable draft controls made today.**

And the Field Control comes complete ready to install.

field

See our exhibit at the 7th International Heating and Ventilating Exhibition, Lakeside Hall, Cleveland, Ohio, Jan. 27-31, 1947, Exhibit No. 25.

FIELD CONTROL DIVISION
OF H. D. CONKEY & CO. MENDOTA, ILLINOIS

Setting a New Standard

SINCE its recent introduction, the new Gillen Oil Burning Floor Furnace has met with wide dealer acclaim and public acceptance. Compactly designed for quick, easy installation and servicing, this outstanding new heating unit for small homes has established a completely new standard for dependable, economical performance.

Complete details available upon request.

J. L. GILLEN CO.

AUTOMATIC OIL BURNING

GILLEN

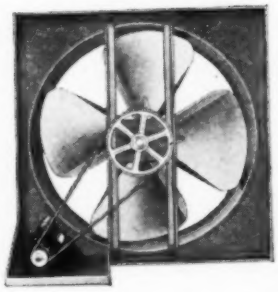
Dowagiac, Mich.

WATER HEATERS AND FURNACES

a Great Market

In every community — your community — a big demand has been piling up for healthful, comfortable ventilation — at home, at work, at public gatherings. Twice as many ventilating fans were sold in 1946 as in 1945.

a Great Product



Silent Breeze Ventilating Fans are a proved product — sell fast and offer plenty of profit margin. Engineered and built by a long-established manufacturer. A great product for a great market.

WITH YEAR-AROUND PROFITS ASSURED BY THE COMPLETE SILENT BREEZE SELLING PLAN

Here you have it—just what you've been looking for to boost appliance sales and to increase appliance profits: A rich and virtually untapped market . . . a product of proved dependability that provides a complete change of healthful, invigorating air for home, shop, factory or public buildings in just a few minutes . . . plus a complete, hard-hitting selling program that produces profitable sales in season and out—*the year-around.*

So cash in on this tremendous, ready-made market for ventilating fans by selling the product that offers maximum profit opportunities and maximum selling assistance. Write or wire today for complete details on *Silent Breeze* Ventilating Fans.

HOLCOMB & HOKE MFG. COMPANY, INC.
1543 VAN BUREN STREET • INDIANAPOLIS 7, INDIANA

Silent Breeze
VENTILATING FANS
VENTILATION PLUS COOLING WITH AIR IN MOTION

Deferred Payment Plan Heads 5-Point Program

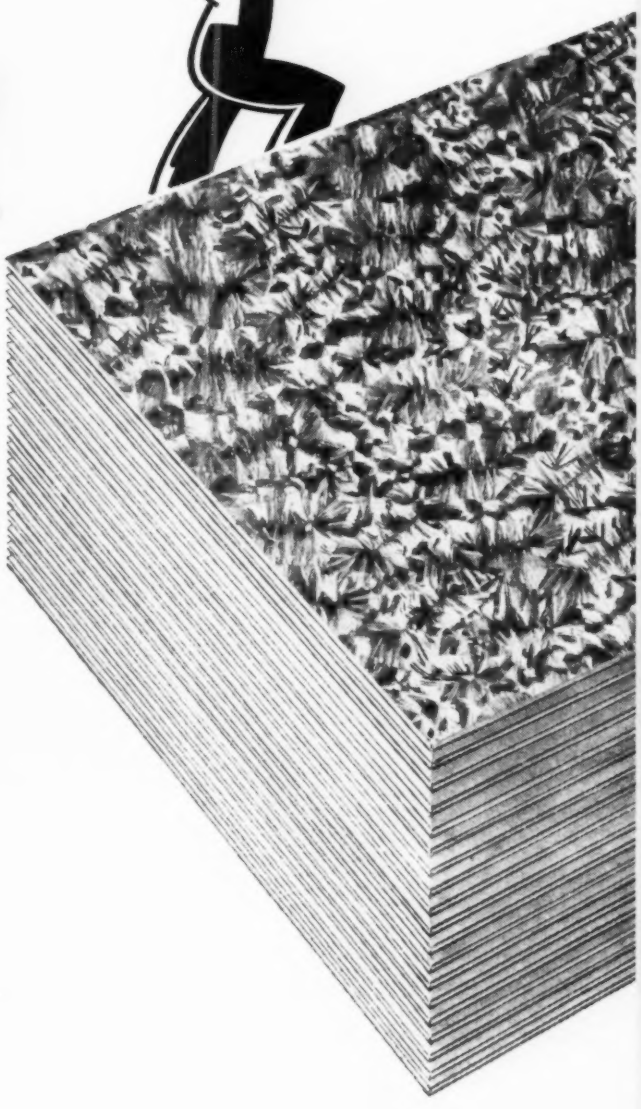
1. WINTER SELLING—Made easy with the Silent Breeze DEFERRED PAYMENT PLAN. Customers can "order today . . . start payments in May!" Forcefully put across in newspaper ads prepared for dealer use. Opens up an entirely new era in selling ventilating fans.

2. SUMMER SELLING—Boosted by a hard-hitting dealer newspaper campaign for the big fan-using months!

3. NATIONAL ADVERTISING—Backing up both summer and winter local campaigns—and in-between—in leading consumer magazines.

4. SALES PROMOTION AIDS—Leaflets, folders, displays and many other sales-builders to keep Silent Breeze in the customer's eye!

5. SELECTION AND INSTALLATION MANUAL—A handy 48-page guide for every dealer, with complete data to make every installation a success! Most comprehensive book of its kind ever published. Write for it.



3 SPECIALISTS *WORTH KNOWING*

● Steel sheets identified by these trademarks are specialists made to meet fabrication needs particularly well.

Popular CONTINENTAL GALVANIZED is uniformly tempered for good workability. It handles well, solders well and is highly uniform—the ideal commercial galvanized sheet. Continental COPPER STEEL provides greater resistance to rust. And Continental KONIK is a premium sheet noted for its greater strength and extra resistance to rust and corrosion. Made of open hearth steel containing copper, nickel and chromium, KONIK gives longer life . . . better service.

Continental Steel Corporation produces galvanized sheets well-known for quality. Get acquainted with these sheets. Ask your jobber about them today.

CONTINENTAL STEEL CORPORATION

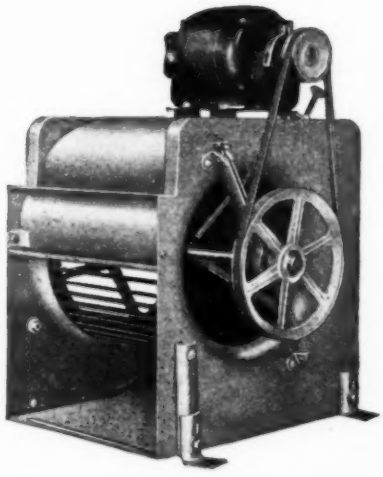
GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF STEEL SHEETS, including Continental GALVANIZED, COPPER-STEEL Galvanized, KONIK steel sheets Galvanized, UNIFORM SPANGLE Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot Rolled Pickled, and many styles of Formed Roofing. ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain Link Fence, Nails, and other steel products.

FOR TOP-FLIGHT FORCED WARM AIR HEATING

Specify REX QUALITY Blowers

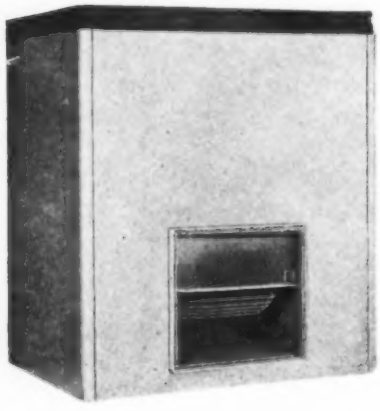
Trade Mark Reg. U. S. Patent Office



No finer blower made for use as original equipment in warm air furnaces. Double inlet housing with large outlet reduces air turbulence, insures quiet operation.

Not 5, Not 10—but 22 Delivery Ratings Available in This Really Complete Line!

The Rex Blower line assures superior service to users because it includes enough models to provide this wide choice of air deliveries (from 400 c.f.m. to 32,000 c.f.m.), each at a number of speeds. Meeting air movement requirements accurately keeps both the initial cost and operating cost of a heating system as low as possible. Why seriously over-power an installation to assure adequate comfort at peak of demand—or grossly under-power one to shave expense, when, in the Rex Blower family, you can readily find a "happy-medium" model that will give maximum all-around satisfaction? See our Catalog No. 222 for complete specifications and performance data charts.



EJR Series Rex Airpak Blower-Filter Unit is ideal for any conversion job. Heavy gauge steel cabinet, finished in sea-green lacquer has eye-appeal PLUS!

TOP VALUE IN BLOWER-FILTER UNITS, TOO

Rex Airpak Blower-Filter Units are designed to provide high delivery capacity at low speed and with low power consumption. Each of these factors is of vital importance when converting gravity warm air furnaces to forced, filtered air operation. Large, efficient filters, quiet V-belt drive, 4-step adjustable pulley for easy speed changes, self aligning self-lubricating bearings, and sturdy, eye-pleasing cabinets, are other features that combine to make Rex Airpak Units your best bet by far for satisfying discriminating buyers. For complete information, see Catalog 238-A.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Air CONTROLS INC
Div. of
The Cleveland Heater Co.

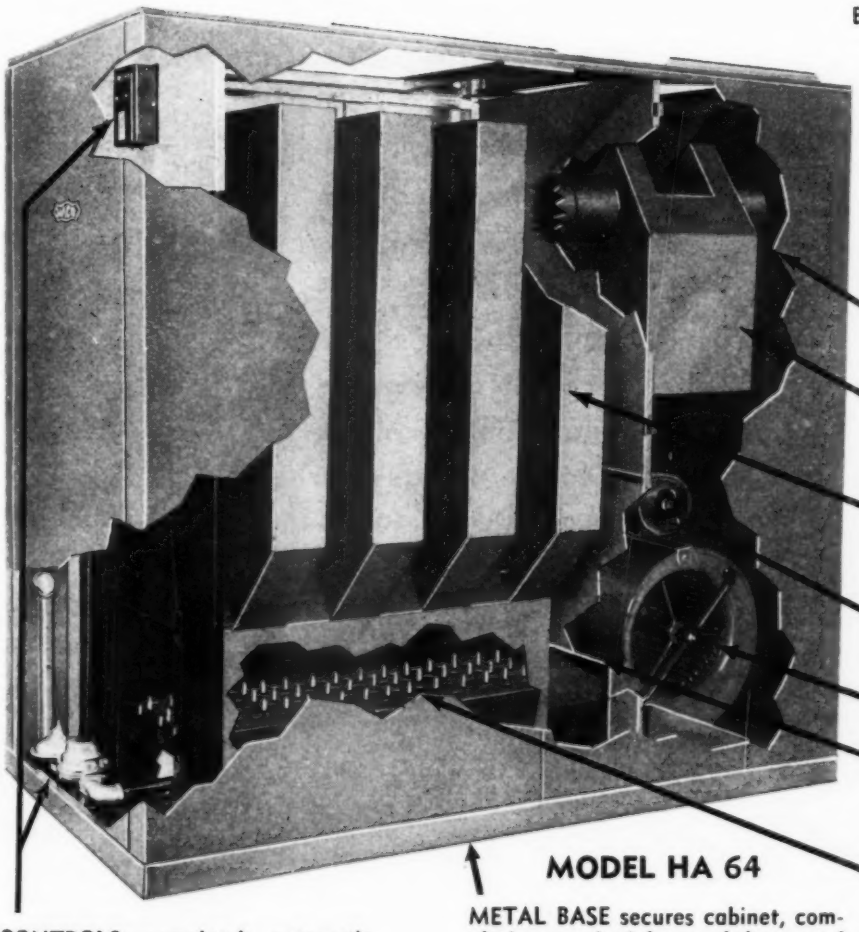
2310 SUPERIOR AVENUE » CLEVELAND 14, OHIO

IT'S WHAT'S *Inside* *the Jacket* THAT COUNTS

HACO

Compare Our Heating Surface with Other Makes of Furnaces

BEAUTIFUL BAKED ENAMEL JACKET



JACKET constructed of 18g metal with interlocking sections. No sheet metal screws necessary.

HEAVY STEEL to insure long life. Designed with maximum heating surface at low consumption of gas which gives high efficiency.

FILTERS—Ample supply of clean healthy air.

AIR PREHEATER to give you additional efficiency—escaping hot flue gases preheat in-coming air.

COMBUSTION CHAMBER AND RADIATORS—all combined in one unit—note structure in our element.

MOTOR—Low current consumption and quiet operation.

BLOWER—Large rotor type blower.

Felt insulated for quiet operation.

ALL WELDED CONSTRUCTION.

BURNER AND AIR DISTRIBUTOR designed to give complete efficient combustion of gases *WITHOUT DANGER OF BACKFIRE.*

MODEL HA 64

CONTROLS—completely automatic —giving heat only when needed.

METAL BASE secures cabinet, completing an air-tight—and dust proof unit.

It Will Pay You to Handle the Haco Line
We Ship Anywhere in the U. S. A.

J. W. HOPWOOD and ASSOCIATES, INC.

7710 Carnegie Ave. **Cleveland 3, Ohio** **Phone EXpress 8400**

* Why modern business looks to Great National for a better evaporative cooling job

* With the experience gained in a quarter-century, embracing thousands of installations . . . the name "Great National" is synonomous with all that is finest in Evaporative Cooling.

GREAT NATIONAL'S

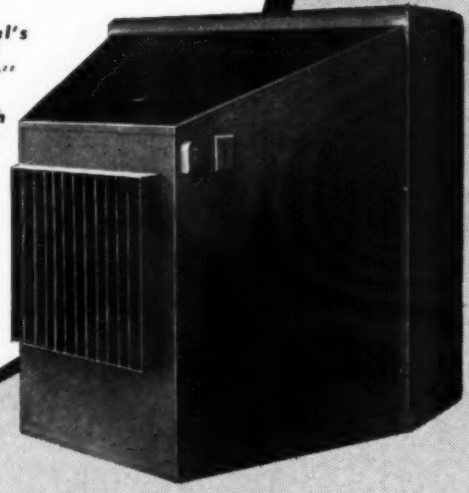
① 1947 *Challenger* cooler

and

② 1947 *Hydro-Spray* Air-Washer DeLuxe model evaporative cooler

available with cooling pads of either spun glass or wood

Great National's sensational "All-Weather" control available with either model



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GREAT NATIONAL AIR CONDITIONING CO.

"Weathercrafters for the Nation"

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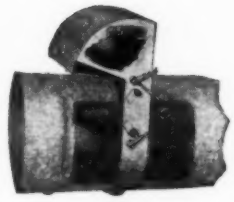
C S E BAROMETRIC DRAFT CONTROLS

BOOTH 339 7th. International Heating and Ventilating Exposition, Cleveland, Ohio. Jan. 27-31, 1947

GUARDING HEATING COSTS 24 HOURS A DAY



Domestic standard round Cole Draft Governor, sizes 5" and up.

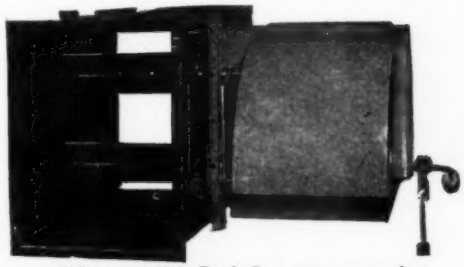
Cole DRAFT Governor

The Cole Draft Governor holds draft to the IDEAL MINIMUM for clean efficient combustion effecting fuel savings up to 35%.

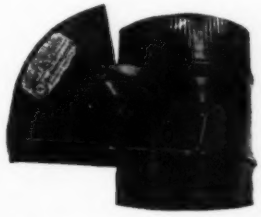
For oil, coal and gas fired heating and power plants, domestic, commercial, industrial—any size.

Fully automatic, accurately balanced at factory, can be installed on any angle without taking down pipe.

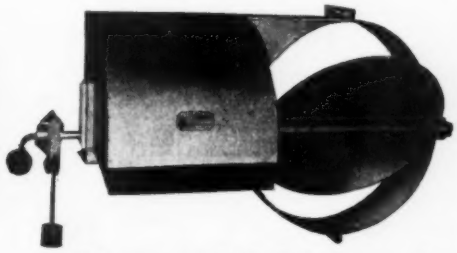
DeLuxe Cole Draft Governor Type C, 6" as shipped.



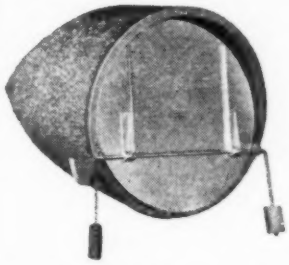
Side mount Cole Draft Governor rectangular, any size, shown installed in breeching.



Standard 5" and 6" space heater control, Type A, as shipped.



Side mount round Cole Draft Governor, size 14" or over.



Industrial standard round Sullivan Draft Stabilizer.

Sullivan Draft Stabilizer

For stoker or oil burner operation. Can be mounted on either side or top of pipe. Models for all standard domestic pipe sizes from 7" through 18",—and for any size or type industrial installation.

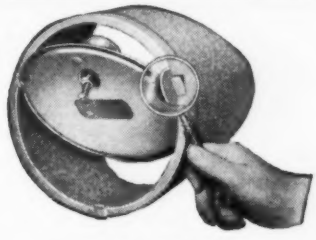
Moving parts perfectly counter-balanced at factory. Domestic sizes equipped with self-lubricating bearings. Industrial controls furnished with ball bearings.

Industrial standard square Sullivan Draft Stabilizer.

Draft KoreKtor, Type F, 906-6". For stoves and heaters. Outside draft adjustment. Shipped as shown with long tee side.

Draft KoreKtor

For the big domestic market. The Draft KoreKtor is a low cost, open check draft control for the enormous domestic market. Ideal for coal installations, automatic or hand fired. Large, close-fitting, non-clogging pivots. Easily and quickly installed, requires no servicing. 10% to 25% fuel saving.

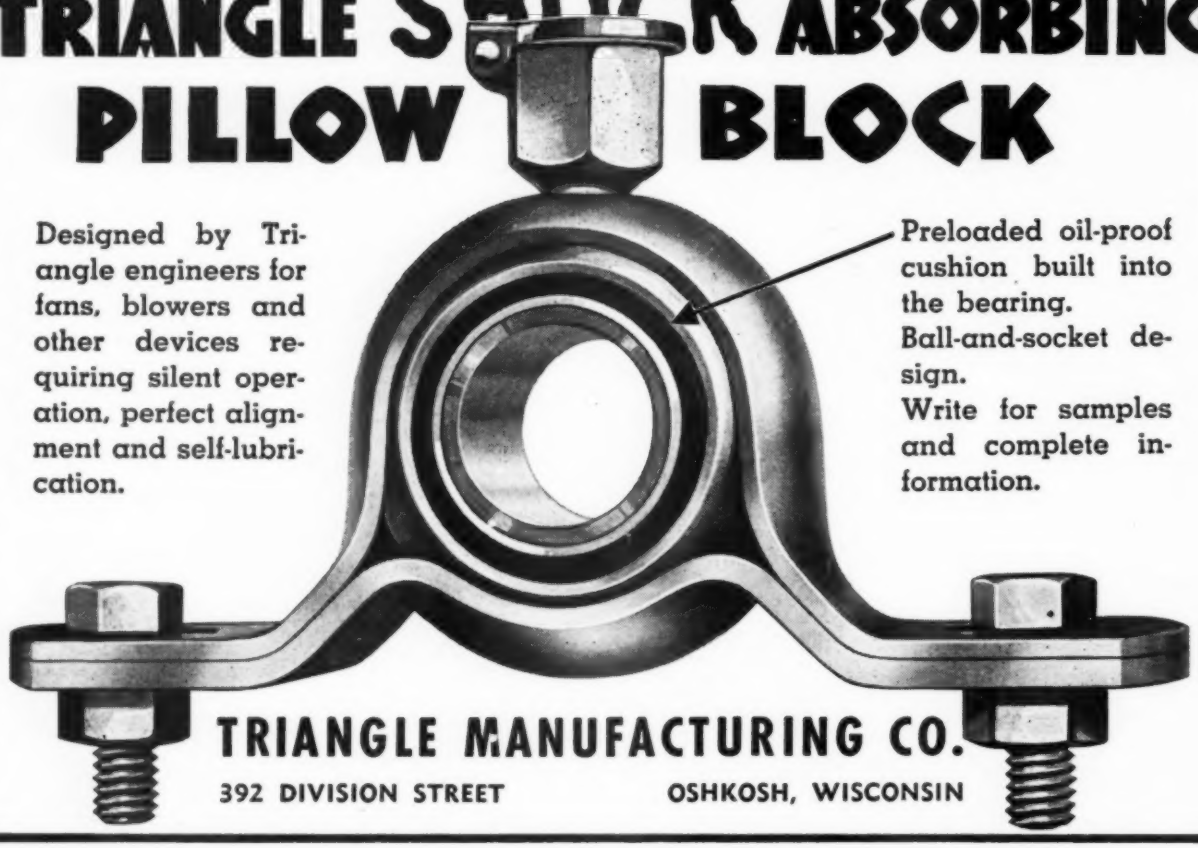


Draft KoreKtor, Type F, 909 and 912. Equipped with universal sleeves to fit all standard domestic pipe sizes from 8" to 12". Knife edge pivots, outside draft adjustment is rust-proof, positive locking.

C.S.E. has specialized for many years in manufacturing a complete line of Draft Controls to enable you to serve your customer's need. Models for every type and size of installation. WIRE OR WRITE FOR COMPLETE INFORMATION.

COLE-SEWELL ENGINEERING CO. 2288 University Ave. St. Paul 4, Minnesota

TRIANGLE SHOCK ABSORBING PILLOW BLOCK



Designed by Triangle engineers for fans, blowers and other devices requiring silent operation, perfect alignment and self-lubrication.

Preloaded oil-proof cushion built into the bearing.
Ball-and-socket design.
Write for samples and complete information.

TRIANGLE MANUFACTURING CO.

392 DIVISION STREET OSHKOSH, WISCONSIN

THERMAC

ALL ALUMINUM HM Appliance REGULATORS

FOR ALL GAS APPLIANCES

- Natural Gas
- Manufactured Gas
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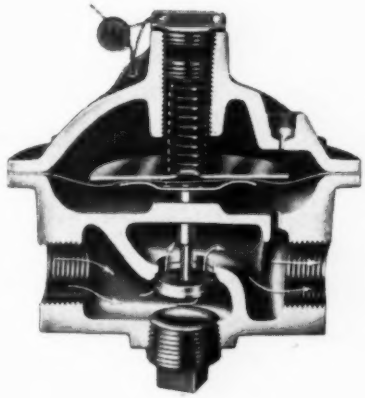
The THERMAC "HM" low pressure gas regulator is easily adaptable to practically every type and size of household or domestic appliance. It is engineered to insure accurate performance under all field conditions with practically trouble-free operation.

"HM" Gas Regulators are ruggedly built of high quality aluminum alloy; are extremely light in weight to facilitate handling and provide for low shipping cost. The sturdy construction will withstand much more than ordinary abuse. Body, cover castings, and all internal parts are of corrosion-resistant materials.

FACTORY TESTED AND SEALED

In Thermac's modern and completely equipped plant every production operation from foundry to final assembly is rigidly controlled for quality and product performance. Each and every "HM" Regulator is factory adjusted and thoroughly tested. It is then set and sealed to the appliance builder's individual specifications. Thermac "HM" Regulators are built for maximum inlet pressure of 15" W.C. and maximum outlet pressure of 5" W.C.



Certified by A. G. A.

Send **FOR COMPLETE DATA**

SIZES FROM ⅜" to 2½" I. P. S.

THERMAC COMPANY
800 East 108th Street
Los Angeles 2, Calif.

Panelaire

RADIANT HEATING

Using Warm Air

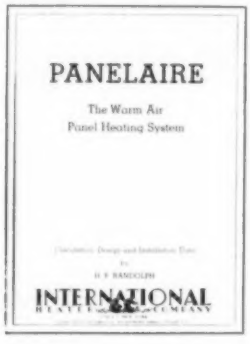
Almost constantly since 1938 experiments have been conducted on Radiant Heating using warm air in the ceiling.

The design and installation data were developed from exhaustive tests and research work in a nine-room house built as a Research Residence for Radiant Heating with warm air. During the interim many installations have been made based on that data—all highly satisfactory.

Under war conditions there was little use to popularize such a system but private building will soon resume and the matter of greatest interest to the home builder today is Radiant Heating.

There is now available a thirty-six page illustrated Design and Installation Manual so complete that anyone who can figure and install forced air can figure and install Panelaire Radiant Heat.

The single copy cost is $1.00. Manuals may be obtained from us, your jobber, or the manufacturer supplying your furnaces.



Get informed on *Radiant Heating* today—the most talked of method of heating. Keep warm air in the lead—*Panelaire Radiant Heating,* using warm air in the ceiling, is the most practical of all Radiant systems. You need nothing more than this Design and Installation Manual to figure and install *Panelaire* Radiant Heating using *any forced air automatic fired furnace.*

INTERNATIONAL HEATER COMPANY

UTICA, N.Y., U.S.A.

***Chicago Office and Warehouse*—1933 Wentworth Avenue, Chicago 16, Illinois**

Manufacturers of Cast Iron and Steel Furnaces for Coal and Oil

DISTRIBUTED THROUGH JOBBERS

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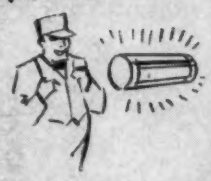
METAL FORMING MACHINERY

Better Sheet Metal Work



Increased Production

MORE PROFITS for YOU

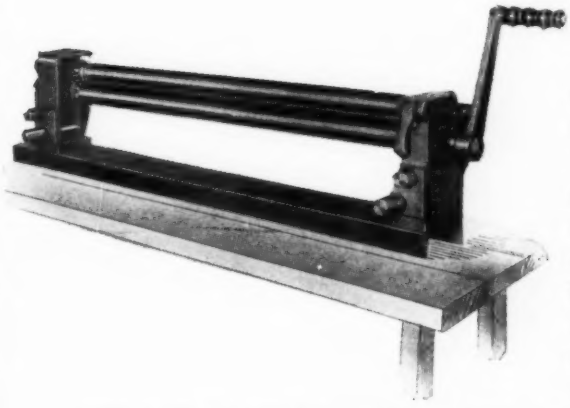
Pittsburgh "DUO-LOCK" *Machine*

NO. 422

Forms Pittsburgh Locks, Double Seam Locks, Right Angle Flanges and Drive Cleats, and can be set up for two forming operations at one time. All rollers are heat treated and removable, giving unusually quick and easy roll changes. All parts of the working head are easily accessible.

The ball bearing motor is completely enclosed. The enclosed stand eliminates danger from the motor belt. No adjustments are necessary for the different gauges making it possible for an inexperienced operator to work this machine which simply plugs into an ordinary light socket.

SLIP ROLL FORMING MACHINE



This machine is sturdily made of heavy cast iron. The forming rolls are of high grade steel, ground and polished, and the entire machine is mounted on a rigid channel base.

All adjustments for gauge of metal and curvature of the sheet are made from the front. There is no need to reach around in back to adjust rolls. In addition to this distinctive front adjustment, another feature of this machine is the new radial adjustment which minimizes flattened area of rolled sheets regardless of curvature. Furnished in both 37" and 31" roll lengths.

RIVERSIDE MACHINERY COMPANY

"NOW AT OUR NEW LOCATION"

SHAKOPEE *MINNESOTA*

Make a bid for *Ventilating Profits* in 1947

It Pays you to recommend

Swartwout ROOF VENTILATORS

. . . Ventilators that you can handle with *More Speed, Less Trouble* and *Greater Profit* to you . . .

● Industrialists are paying attention to ventilation of factory buildings as never before. Give them your help in working out their ventilation problems with the comprehensive Swartwout Line which includes equipment for all roof ventilation needs. You can count on our engineering assistance when you need it, to make your installations as effective as possible. Write for full information on Swartwout Industrial Ventilators today.

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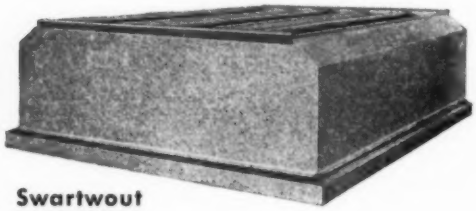
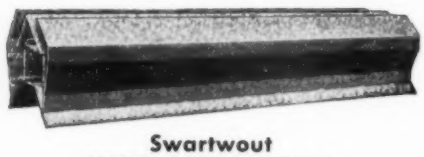


Swartwout AIRMOVER

Swartwout AIRJECTOR



Swartwout DEXTER HEAT VALVE

Swartwout JECT-O-VALVE

Look for Roof Ventilation Opportunities in these Active Operations . . .

All Industrial Buildings
Airport Hangars and Repair Shops
Garages • Warehouses
Bus Terminals
Foundries • Heat Treating Plants
Railroad Shops • Laboratories

Don't Overlook the Residence Field

Also made flush type for old houses.

Get your share of the under roof ventilation in the millions of new houses that must be built. Swartwout Louvers and Roof Ventilators for residences are high-quality products—all steel welded construction, with latest advantages in flashing arrangement, and ease of installation. Handsome appearance and sturdy construction make them easy sellers. Write for Bul. 317-B.

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to look at a
Complete Furnace Line

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SINCE 1900

AUTOMATIC GAS
AUTOMATIC OIL
STOKER FIRED
SOLID FUEL

Years ahead in design. Engineered and manufactured with the "know how" that comes from forty-seven years of dependable furnacemaking. And this year, better than ever with new models... redesigned models. All featuring the same old dependable quality that makes the AFCO line a profitable line. Send for free full color bulletins offered below.

A Few Franchise Areas Still Open

The AFCO line is recognized as a valuable asset. Inquire about the franchise availability in your area.

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Please send me full color bulletins containing detailed information about the type heating units I have checked.

*Name*_____

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17

AMERICAN FURNACE CO.
ST. LOUIS, MO.

AEROFIN

gives you QUICK HEATING . . .

. . . FAST COOLING

AEROFIN construction—metallic bonding and complete tinning—assures highest practical heat transfer and protection from corrosion. Aerofin engineering—based on accurate published ratings—fits the right equipment to the job. A complete range of designs for every kind of heat- transfer application. Compact, easy to install. Experienced Aerofin field engineers are ready to help you with your heat-exchange problems.

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is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

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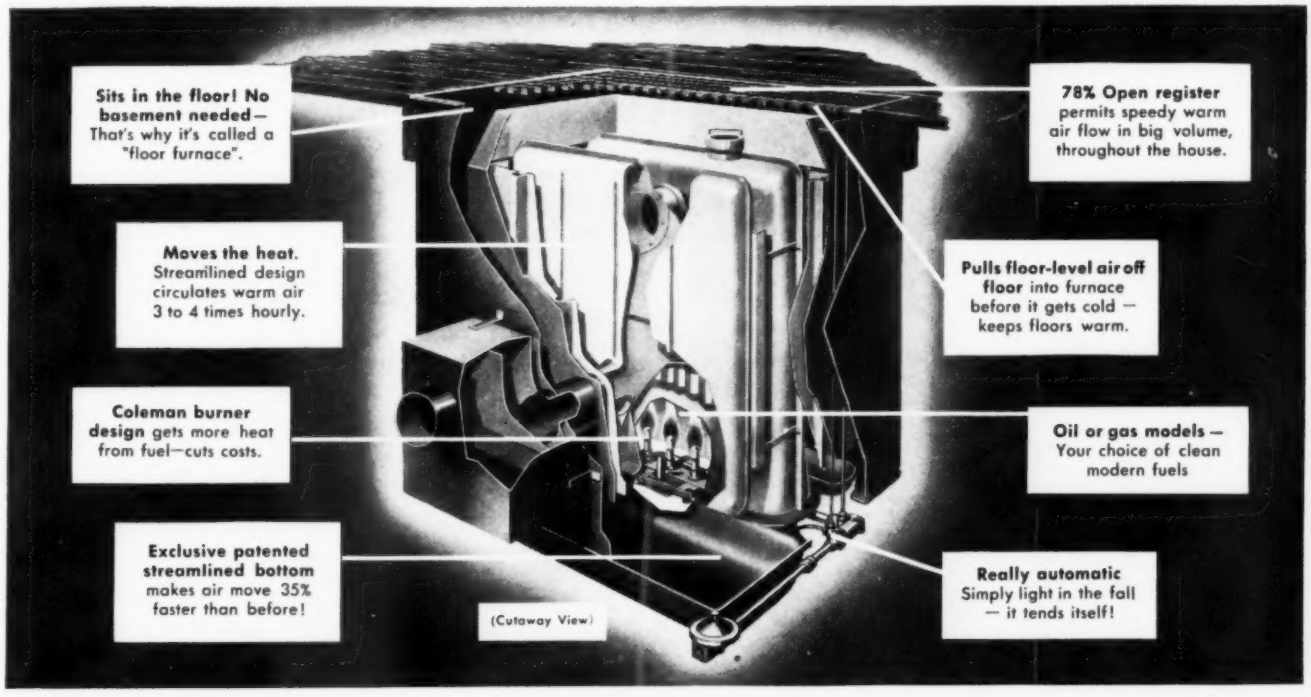
NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

New Kind of Furnace!

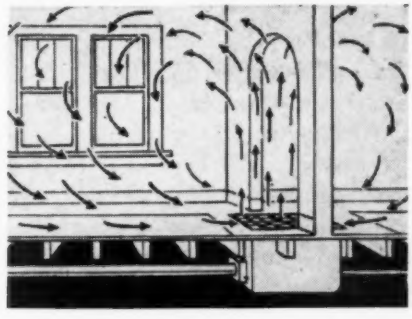
Engineered to meet all modern needs and proof-tested for performance


Sits in the floor! No basement needed— That's why it's called a "floor furnace".
Moves the heat. Streamlined design circulates warm air 3 to 4 times hourly.
Coleman burner design gets more heat from fuel—cuts costs.
Exclusive patented streamlined bottom makes air move 35% faster than before!
(Cutaway View)
78% Open register permits speedy warm air flow in big volume, throughout the house.
Pulls floor-level air off floor into furnace before it gets cold — keeps floors warm.
Oil or gas models — Your choice of clean modern fuels
Really automatic Simply light in the fall — it tends itself!

Coleman engineering research has developed this Coleman quality and performance

Solid comfort is the result of Coleman's engineering and research — a background of years that has taught Coleman how to make the most efficient use of all types of gas and oil heating equipment. When you install properly engineered equipment like Coleman's, your job is made easier and your customers happier.

Clean heat means satisfied women customers. Automatic, economical heat means satisfied men customers. "Warm-Floors" performance pleases the whole family. There are models for gas or oil —the clean, easy-to-handle fuels. So you satisfy everybody when you install dependable Coleman Floor Furnaces.

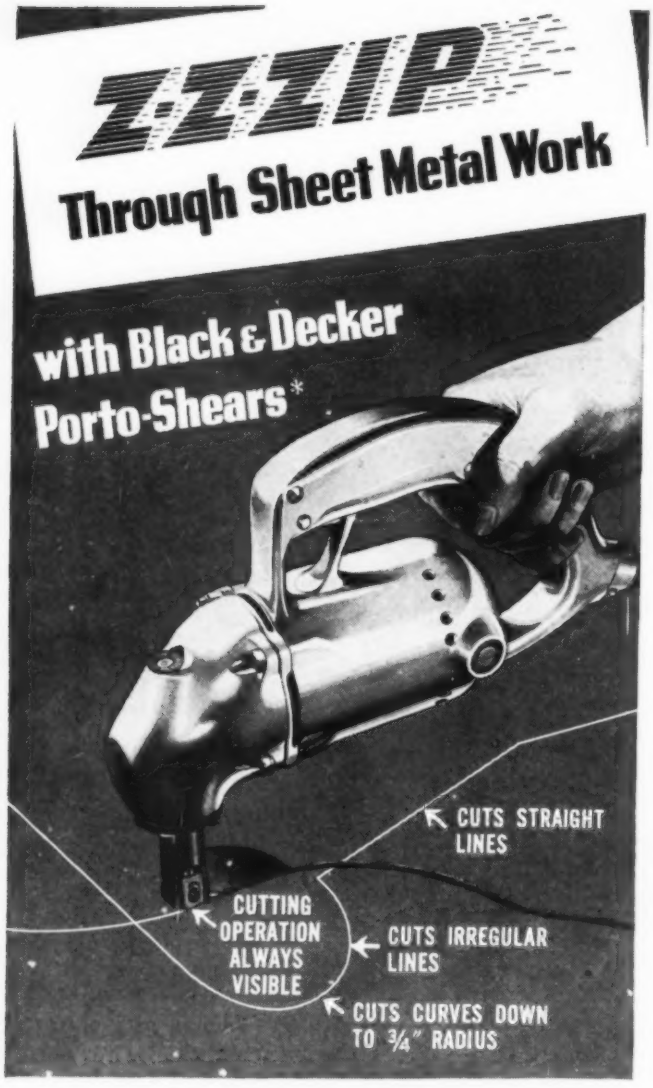


It really moves the heat. Arrows show circulation of warm air. Sits in the floor—a compact, completely packaged unit. No basement or air ducts needed. Easily hooked up to gas or oil lines and to chimney vents. A quick, clean, satisfactory installation can be made in 3 to 4 hours, average time.

For more complete and technical information on Coleman Gas or Oil Floor Furnaces, write the Coleman office nearest you.

The Coleman Co., Inc., Dept. AA-651, Wichita 1, Kas.; Philadelphia 8, Pa. (Terminal Commerce Bldg.) Los Angeles 54, Calif.

AUTOMATIC Coleman HEATING



Black & Decker Electric Porto-Shears cut sheet metal too tough for snips, speed up jobs where snips are slow. Fast, powerful shearing action eliminates hard muscular strain. Easy to follow patterns because cutting operation is always visible. B & D 16-Gage Porto-Shears cut up to rated capacity in steel or galvanized iron; about one gage thinner in Monel or stainless; 50% above rating in copper, aluminum, lead and other non-ferrous metals.

For full information on cost-cutting Porto-Shears . . . and other Electric Tools for heating, piping and air conditioning work . . . see your nearby Black & Decker Distributor. For your free copy of our complete catalog, write to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

See our exhibit at the

7TH INTERNATIONAL HEATING AND VENTILATING EXPOSITION

Lakeside Hall, Cleveland, Ohio — January 27 to 31, 1947

Association Activities . . .

Minnesota

(Continued from Page 184)

ganizations and a parallel group — Sheet Metal Building Trades Council composed of employers. These two groups working with and through the Labor Relations Committee are expected to settle most twin-cities labor problems.

Editors Give Case Examples

Editors Wilder of American Artisan, Carter of Snips and Sheet Metal Worker representative Mahoney briefly described some of the things other local and state associations are doing to stimulate interest in association work and some of the problems and activities of these groups, such as legislative committees, schools in heating, licensing enforcement, labor discussions, etc.

•

Wisconsin

THE program for the Convention of the Sheet Metal Contractors' Association of Wisconsin has been announced and will be as follows:

Monday, Feb. 10

9 A. M.—Registration and Distribution of badges.
Remainder of morning open for visiting Booth Displays.

2 P. M.—Announcements—President of Association
Chairman, Convention Committee
Speaker: Otto Ress, Milwaukee
Subject: Gas Heating
Forums: Warm Air Heating & Air Conditioning
General Sheet Metal Work (Industrial, etc.)
Sheet Metal Fabrication
Note: Forums will be scheduled so that everyone can attend all three, if they so desire.

Tuesday, Feb. 11

9 A. M.—Open—Display Booths on Exhibition

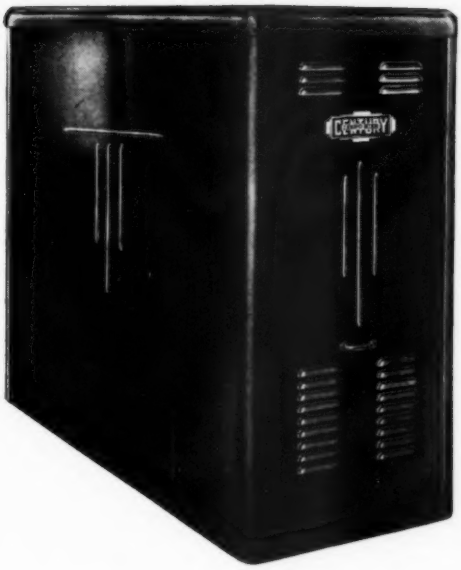
2 P. M.—Business Session (Members Only)
Report of Officers
Report of Committee Chairmen
Treasurer's Report
Constitution and By-Laws Revision
Election of Officers and Board of Directors

Wednesday, Feb. 12

10 A. M.—Movies (Crystal Ballroom)
"Stack Damper Setting or Effect of Furnace Draft on Stoker Performance"
"Effect of Air Regulation on Domestic Stoker Performance"
(Films furnished by National Warm Air Heating and Air Conditioning Association)

2 P. M.—Reports of Chairmen of Forums (Discussion)
Miscellaneous Business
Adjournment
Meeting of the Board of Directors for the election of Officers for the year 1947-48.

In addition to the business sessions as scheduled above the convention committee has made extensive plans for entertaining the delegates. As in the past a feature of the convention will be the "Hospitality Room."



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Precision Built

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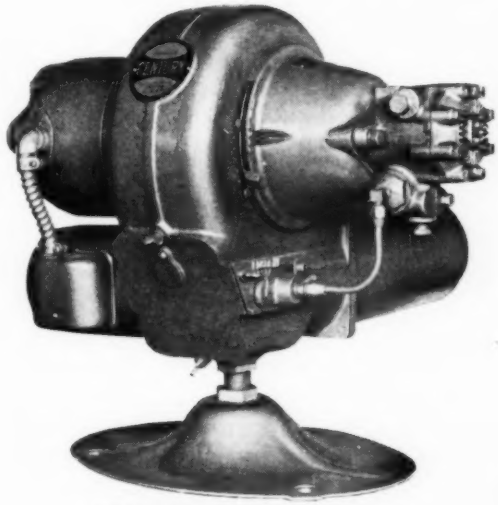


CONVERSION OIL BURNER

Domestic water units and boiler burner units have been temporarily discontinued from our line due to material shortages.

Manufacturing Integrity . . . the formula that for 20 years has produced the kind of oil-fired heating equipment you can sell with confidence. The very finest production methods and exacting tests before the burner or unit leaves the assembly line guarantee Century products will give many years of trouble-free operation —an important factor to service-conscious dealers.

Investigate the complete Century line of oil-fired heating equipment now. It's tailor-made for alert dealers who back their sales with customer service.

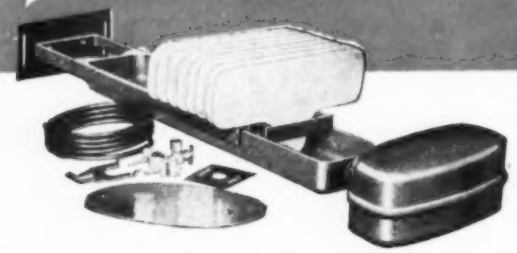
CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

Check these advantages in the New Viking Humidifier

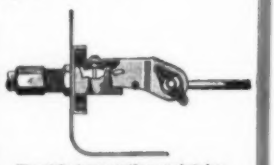
VIKING "TOP SEAT" FLOAT VALVE

COPPER FLOAT TANK

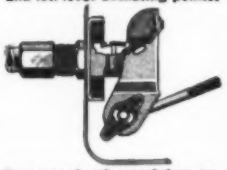


For Dependable Humidification

Positive Action



Throttle type action maintains the proper water level at all times . . . no complicated high and low level actuating points.



For occasional servicing or cleaning the brass wing nut can be loosened and the whole assembly exposed.

Disengage the brass cotter key and the complete float assembly can be removed for inspection or cleaning.

Here is the humidifier you've been waiting for. Simple and easy to install and designed to operate for years with little or no attention.

Exhaustive study and research under actual operating conditions has dictated the need for a simple, easy to clean valve and an acid resisting water supply tank. Viking has the solution.

THE VALVE

Made entirely of brass and located above the water level in the supply tank. Simple rocker action . . . no springs no sliding parts.

THE TANK

Deep drawn from 24 oz. copper in a single piece . . . no seams . . . no welds. Located outside the bonnet or plenum . . . readily accessible for occasional inspection or cleaning.

WRITE TODAY

. . . get complete information and specifications on a dependable humidifier.

Viking

ARMY E NAVY FOR EXCELLENCE

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

News Items . . . .

Benjamin D. Watchler Dies in Accident

BENJAMIN D. WATCHLER, of Lakewood, Ohio, representative for the Waterman-Waterbury Company in Ohio and Indiana was killed instantly in an automobile accident on Saturday, December 21, near Defiance, Ohio. Mr. Watchler was returning home for the holidays from a business trip through his territory.

Mr. Watchler was connected with the Waterman-Waterbury Company for more than 35 years—part of the time in Western Canada, but for the past 20 years in the Ohio-Indiana territory. In those years he developed a wide acquaintanceship among dealers and was personally known to hundreds of men in the warm air heating industry.

In addition to his widespread business interests, Mr. Watchler gave generously of his time and energy to Baptist church work.

Mr. Watchler is survived by his son Willard who, after working with his father, has lately been with Cleveland Steel Products, Toridheet Division, in Cleveland; also by his wife, Ruth of Lakewood, Ohio; two daughters, three brothers, three sisters.

◆

Move To Restore Veterans Former Wage Scale

SO much criticism has been expressed over the last change in the veteran apprentice wage scale that strong efforts will be launched when the new Congress convenes to restore the former basis of pay. Under the former scale a veteran was entitled to $65 if single or $90 if married per month plus his monthly earnings from wages. The revised law set a maximum of $175 if single or $200 if married from both his government allowance and the employers wages. The revised law also restricts to two years the time during which the veteran may be in training. This despite the fact that most construction on-job training programs run from 4 to 5 years.

Many veterans have quit their construction industry training and the whole purpose of the program seems jeopardized. In view of the great need for trainees and apprentices in our industry it will be well for association members to express their needs to their elected congressmen.

◆

Examine Your Cash Discounts

THE practice of extending cash discounts is widespread, but too few business men realize what such discounts really mean. Here is a brief picture:

2%—10 days, net 60 days—you are paying 2% to get your money 50 days before it is due net—an interest rate of 14.9% per year.

2%—10 days, net 30 days—you are paying 1% to get your money 20 days before it is due net—an interest rate of 18.4% per year.

1%—10 days, net 30 days—you are paying 2% to get your money 20 days before it is due net—an interest rate of 37.2% per year.

There's considerable doubt that cash discounts are useful today; one school holds that net cash terms are more acceptable than outright price increases and for the seller net cash terms are just as real as a price boost—while business remains healthy.

CROWN Heat King GAS BURNER

Designed and manufactured by heating engineers to give the best in heat and the ultimate in performance.

The low initial cost, the simplicity of installation and operation, the high fuel efficiency, compactness and beauty makes the "Heat King" an easy seller to the thousands of potential gas conversion burner users throughout the country.

The "Heat King" is built in two sizes to fit any type furnace thus assuring maximum efficiency for every installation.

Sales are easy because the low price and economical operation fit any budget.

For complete information regarding distributorship and franchise write or wire immediately.

MANUFACTURED BY

B. G. B. MANUFACTURING COMPANY

5021 WYOMING, DEARBORN, MICH.

CERTIFIED BY AMERICAN GAS ASSOCIATION

VISIT US AT THE CLEVELAND CONVENTION
BOOTH No. 948

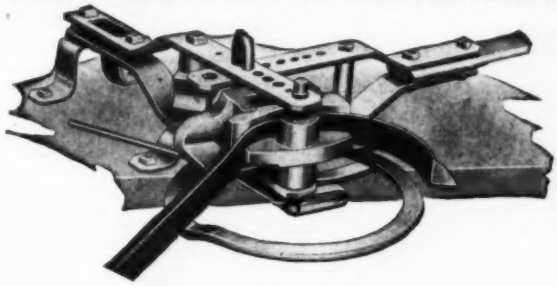
The HOSSFELD UNIVERSAL IRON BENDER "WRENCHLESS TYPE"

Patented in the U.S. and Canada

Bends Pipe, Bars and Angle Iron

Let the Hossfeld Bender Solve Your Bending Problems

No other Bender on the market like it.



Samples of Bar Bending

Samples of Pipe Bending

MANUFACTURED ONLY BY

Hossfeld Manufacturing Co.

WINONA, MINN.

News Items . . . . . .

May Go Slow on Wage Increases

RICHARD GRAY, President of the AFL Building Trades Department has announced that construction crafts have been asked to "go slow" on new wage demands until price levels settle down or stabilize. Exploratory studies have been launched. Some wage increases are now being asked in several cities by various crafts. Whether these will be granted has not been finally decided.

President Gray and President William Green, speaking in Chicago to the 27th annual convention of the Sheet Metal Workers International Association both declared that private enterprise—if given a free market—could and would solve the housing problem. They said the need today is for "full production" and that only under full production is there a sound basis for wage increases.

◆

Five-Day Week

THE practice of Saturday and Sunday overtime work in Chicago's construction industry, prevalent for some time is strongly urged by the Building Construction Employers Association.

It is believed that strict compliance with working agreements which provide the 40-hour week, and permit overtime only on occasions of emergency, will entirely remove the pirating of mechanics which has been instrumental in causing some contractors to consider over-scale wage payments as necessary in order to retain their workmen. It is generally admitted that overtime fails to increase the production of a normal five-day week and employers often find that mechanics who have worked Saturday and Sunday at overtime rates, are absent during the regular week.

◆

Wage Controls Abandoned

WAGE and salary stabilization controls, under the Stabilization Act of 1942, were terminated as of November 9. Price control was also killed except for a few items. Washington states that persons subject to both acts must maintain their records for one year, or unil November 9, 1947. Whether or not violations should be brought into court is still being debated.

◆

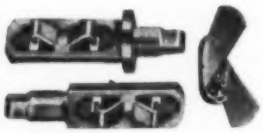
Health and Welfare Plans

REPORTS are that AFL unions are going to push for health and welfare plans in 1947—John L. Lewis got a plan for the miners; other unions want the same. Also, the Wagner-Murray-Dingell bill calling for government health insurance—sidetracked last year—is slated for revival. The initial cost of this government plan (medical, dental, nursing, hospitalization benefits) is figured to run about 4 per cent of payroll and may reach 6 per cent. A good idea, perhaps, is examination of the alternate insurance company or mutual aid associations or private medical and hospitalization plans which offer a wide range of voluntary coverage.

E-Z-ON . . . *The Popular* DAMPER REGULATOR *for Heating Systems . .*

- Uses less Critical Materials
- Cuts Installation Time in Half
- Easy to Install with Unskilled Helpers
- Makes attractive, rattle-free job

Standard E-Z-ON



No. 27. ⅜ inch bearing. Solid end tail piece.

Simple to Install . . .

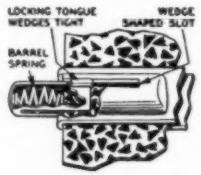
The E-Z-ON is a favorite of sheet metal men everywhere because of the time it saves on every installation. Any man who can swing a hammer can install it. Just slip the regulator over damper edge with prongs over scribed center line. Lay assembly on block of wood, and drive prongs through the sheet metal, then turn over and clinch prongs. Prongs are strong enough to pierce 20-gauge metal.

Snap-Tite E-Z-ON with Retractable Tail Piece

No. 29. ⅜ inch bearing. Tail piece with snap end bearing.

This IMPROVED E-Z-ON with Retractable Tail Piece avoids any need for bending the damper or springing the pipe to insert the damper. Just attach the same as the Standard E-Z-ON, then insert the head piece through one end, slide the Snap-Tite Tail Piece over the opposite hole and it automatically snaps through the hole and LOCKS, free of rattle.

E-Z-ON Retractable Tail Piece with Patented Locking Feature



The locking tongue and wedge shaped slot is a patented feature of the Snap-Tite that makes it superior to other snap end bearings. When movable bearings snaps out through pipe hole upon installation, the lug or locking tongue wedges securely in the tapered slot and avoids all chance of rattle, firmly locks into position.

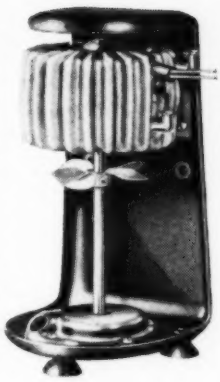
Save labor, time and money on Damper Installations . . . with E-Z-ONS. Jobbers everywhere stock them.

M. A. GERETT CORPORATION
724 WEST WINNEBAGO STREET - MILWAUKEE 5, WISCONSIN

Morey Products

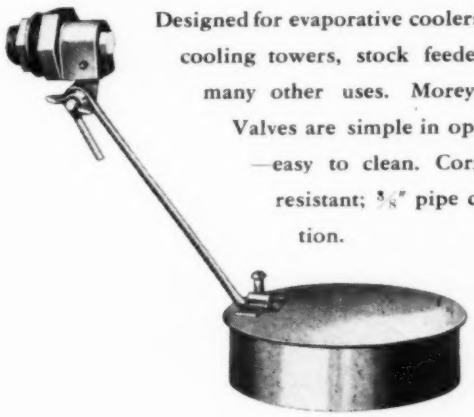
SPELL BIGGER PROFITS FOR YOU IN 1947

RECIRCULATING PUMP



This small, sturdy 2 g.p.m. recirculating pump has ample capacity for all sizes evaporative coolers. Excellent for circulating coolants, spot welding, all light industrial pump uses. Only 10" high, weighs but 7 lbs. Stainless steel shaft; brass impeller designed for maximum output; self-aligning oilite bearings. Pump stand of 16 gage steel, vitreous porcelain coated. Mounted on rubber feet. Aluminum enclosed 1:50 h.p. fan cooled motor. Furnished for 110 or 220 volts.

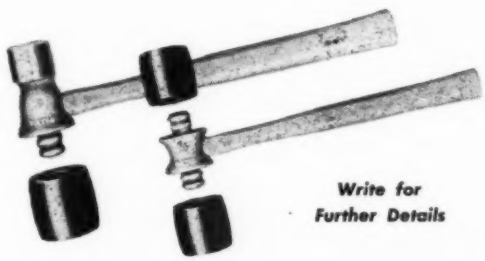
MOREY FLOAT VALVE



Designed for evaporative coolers, small cooling towers, stock feeders and many other uses. Morey Float Valves are simple in operation —easy to clean. Corrosion-resistant; ⅜" pipe connection.

MALLETS AND HAMMERS

Morey Ace 2-1 Mallets have combination hard rubber and fiber heads. Ideal for a large variety of uses in sheet metal and other work. Tough heads give long service, yet easily replaceable. Aluminum shank, seasoned hickory handle. Weighs only 1¼ lbs. Ace 2-1 Hammers are equipped with combination steel and rubber heads—weight 2¼ lbs., drop forged shank.



Write for Further Details

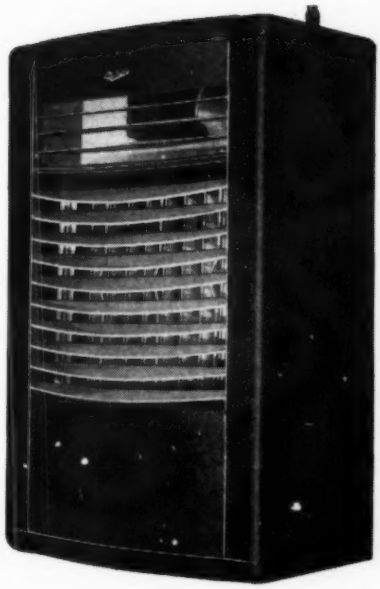
Dan Morey

814-16 SO. ROBERTSON BLVD., LOS ANGELES 35, CALIF.

The New Pace Setting

Palmaire

SUSPENDED UNIT GAS HEATER



Constant Dependable Heat At Low Cost . . .

CHECK THESE SELLING POINTS

- Easy to inspect and clean . . . controls and burners in sliding drawer assembly.
- Fully automatic
- Adjustable air deflectors
- Requires no floor space
- Eliminates problem of central heating

A.G.A. Approved 100,000 B.T.U.

WRITE FOR CATALOG

Palmer MFG. CORP.

Phoenix, Arizona

News Items . . . . . .

The "Recession"—When—How Big?

EVERYONE is making guesses on the "recession." A composite of some of the latest prognostications shows: (1) Most experts predict the time as 1947. (2) Nobody expects a magnitude like 1930. (3) Unemployment is "guessed" at from 4 to 7 millions. (4) Some say the "dip" will last four months; others one year; average 6 months.

As to "why" there is somewhat closer agreement: (1) present boom has too many maladjustments. (2) Prices of too many things have gone too high and business will slump when prices start to decline. (3) "Soft" goods like food and clothing are reaching over-production so a decline will come; but hard goods and construction have never gotten into stride so boom times will continue in these lines. (4) Business has been buying too much inventory and must stop ordering to prevent unwieldy inventories. (5) Wall Street has been betting on a "dip" since stocks broke last September.

Offsetting this are the facts: (a) Americans have saved up 150 billions of dollars which, generally, they have not been able to spend on substantial things—cars, homes, factories. (b) There are now many new props against continued or long decline: union wage rates much higher than formerly; farm price guarantees; unemployment insurance. (c) Construction, the stabilizing industry, is far behind in its program, literally millions of new and modernized homes, factories, stores, facilities are so badly needed that construction dare not stop even if there is a dip.

Organizing Sub-corporations

ANY business man organizing a sub-corporation for purposes of operating two or more firms jointly, but separately capitalized, should know there is a tax angle which bears watching.

Wrong Way: If you organize such a sub-corporation do not transfer assets to the corporation in return for both common and *preferred* stock expecting later to withdraw stock from the corporation tax free by redemption. If you do you should know that the full redemption price will constitute a taxable dividend to the extent of accumulated earnings and profits. Right Way: The corporation's capital should be represented by bonds or notes. The subsequent retirement of the debt represented by the bonds or notes will not be treated as a taxable dividend, but as repayment of a loan.

◆

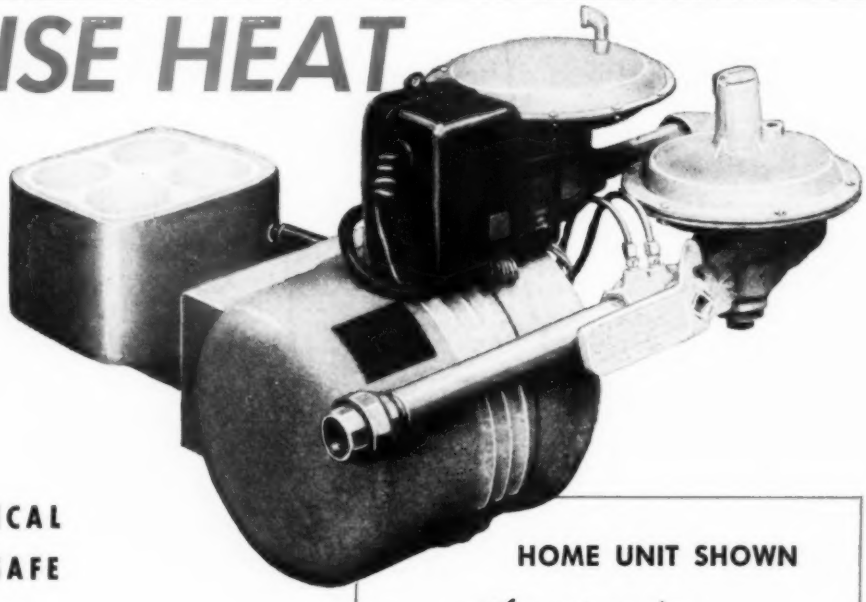
May Up Job Training Allowances

CERTAIN members of the incoming Congress have stated they are in favor of increasing the on-the-job training allowance of veterans. Current talk is $225 for single men and $250 for married men. Reason given is that too many needed veteran apprentices have left their training jobs because they cannot live on the $175 and $200 now being paid. There is also talk of opening up for study the matter of making $225 and $250 the total amount a veteran may draw—some incoming Congressmen claim to see much merit in the former plan of no ceiling on earnings but a ceiling on what the government pays.

FINN-TENSE HEAT

POWER TYPE

GAS BURNER



● EFFICIENT ● ECONOMICAL
● EASY TO INSTALL ● SAFE
● AUTOMATIC ● PROVED
● PATENTED FEATURES

HOME UNIT SHOWN

other sizes for . . .

STORES • BANKS
APARTMENT BUILDINGS
SCHOOLS and
INDUSTRY

Write for details

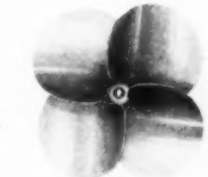
JERRY FINN ENGINEERS, INC.
HEATING DIVISION
201 No. FIRST NATIONAL BANK BLDG., ST. PAUL 1, MINN.

WANT PROPELLERS *in a hurry*?

BURDEN BLADES

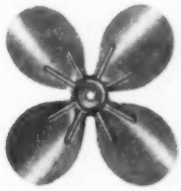
BURDEN can ship 'em! Not today, for we have our material and production problems, too. But prompt deliveries can be made on certain sizes of Full Pressure, Semi-Pressure and Free Air Blades. Full and Semi-Pressure Propellers are made of finished aluminum with plated steel spiders. Free Air type Burden Blades come in all steel, plated for attractiveness and rust resistance. Perfect balance assures air flow volume at its maximum. Attractive enough for any impeller equipped product—suitable for most.

Specially Designed Blades • Wire Phone • Write for Quantity Prices



Aluminum Full Pressure Type. Available in 8" thru 24" sizes.

Aluminum Semi-Pressure Type. Available in 10" thru 30" sizes.



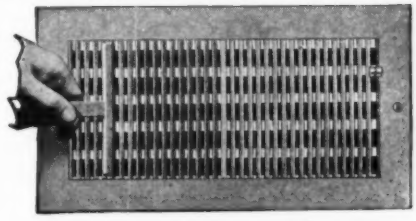
Free Air Blades (plated steel). Available in 6" thru 12" sizes.

burden COMPANY

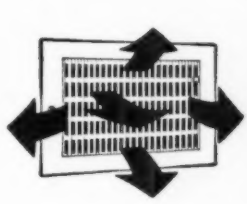
1000 N. ORANGE DRIVE • LOS ANGELES 46, CALIF.

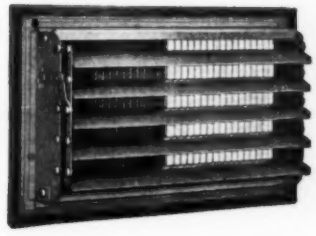
Independent

WROUGHT STEEL REGISTERS PROVIDE 4 WAY ADJUSTABLE AIR FLOW



Design No. 238





Right . . . left . . . up . . . down . . . air flow at any angle desired, in addition to straight outward . . . plus the durable construction which has distinguished Independent products for more than 46 years . . .

These are the reasons for the popularity of this No. 238 Independent Wall Register. Vertical grille bars are manufactured at an angle of 30 degrees, one-half to the right and one-half to the left. They may be bent to direct air flow at any other right or left angle or straight outward. Horizontal multiple valves located at the back of register can be set to deflect air flow up, down, or straight outward. Available in standard sizes 8"x6" to 30"x8".

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

Send for Catalog 41-AC

Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET • CLEVELAND, OHIO

News Items . . . . . .

Social Club Dues Deductible

JOINING a social club and deducting the dues on income tax report has become pretty common practice, but the tax courts have recently ruled that just because your customers belong is not reason enough for you to deduct the dues in your tax report. The dues are deductible, but you must be able to show the names of new customers obtained through the club contacts or to show actual amounts of any business obtained directly from the membership.

◆

One In Every Seven

WONDER where your tax dollars go?

Well, for one thing (and a great big thing it is, too!), the government in Washington is issuing pay checks to almost 20,000,000 people.

In other words, one of every seven Americans is on the Federal government's direct payroll.

And all this costs the tax payers something like $1,701,000,000 a month.

Direct payments, either from Washington or through state channels, go to 19,484,803 persons, at a yearly cost of $20,400,000,000—or about half the annual Federal budget. The military establishment accounts for a mere 2,454,056 officers and men and women of the Army, Navy, Marines and Coast Guard.

In addition to the $1,701,000,000 a month paid out by the government directly to individuals, other Federal funds are expended in such indirect routes as government contracts, subsidies, school lunches, farm loans, business and power loans, maternity-care programs, and Indian benefits.

◆

Tax Cuts Expected

ACCORDING to Washington observers, the Republican victory in both houses may advance the tax reduction timetable by one full year. Congressman Knutson introduced a bill for tax reduction at the initial session of the house calling for a 20 per cent reduction.

There is a fair chance, say observers, that the full 20 per cent reduction will be passed. However, Democratic opposition, plus some go-slow attitude by Republicans may shade the final reduction to 15 per cent.

◆

New Veterans Hospitals

THE Veterans Administration $448,000,000 hospital construction program will require 70,000 man hours of on-the-job labor by building tradesmen, declares VA's construction service. The program will provide employment for thousands of workmen and medical care for thousands of disabled veterans. General Bradley, administrator of the veteran affairs, says it is the largest hospital construction program in the history of the world. VA hospital construction during the last 27 years totaled only $270,000,000 as compared with the $448,000,000 which will be spent in the next few years.

(Continued on Page 260)

Sectional construction and square shape permits access door to be placed on any side of cabinet.

FURBLO

Quality in blowers is just as important as in any other item in a modern warm air air conditioning installation. A reliable Furblo Blower will assure you of the finest performance for the maximum time. These superior blowers are constructed with that thought in mind . . . equipped with quiet, long hour duty motors that are rubber mounted and meet all power company requirements, Dustop filters, Minneapolis-Honeywell controls, variable speed belts and automatic overload cut-out protection, they will enable you to meet the most exacting requirements on any installation. Right behind *every* Furblo blower is the reputation and experience accumulated over many successful years of building the finest obtainable blowers.

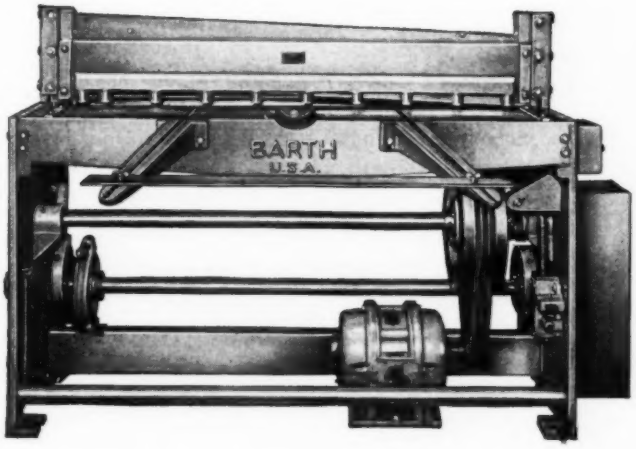
More information is yours for the asking. Please write for it today.

FURBLO CO., HERMANSVILLE, MICH.

BARTH

ADDS ANOTHER NEW PRODUCT

To A Rapidly Growing Line!



Absolute finality in design and construction, this new 14-gauge, 52" Power Shear represents long, careful study of the sheet metal fabricator's needs. Outstanding among its features: a new drive arrangement and clutch which greatly enhance power and handling. Write for booklet.

BARTH PRODUCTS

Foot Squaring Shears
Foot Gap Shears
Bar Folders
Slitting Shears
Bar and Rod Shears
Combination Deep Throat Bench Machines
Wiring Machines
Edging Machines
Turning Machines
Burring Machines
Flanging Machines
Brace and Wire Benders
Bench Plates
Cast Iron and Steel Stakes
Rivet Sets
Tool Makers' Drill Stands
Hand Groovers

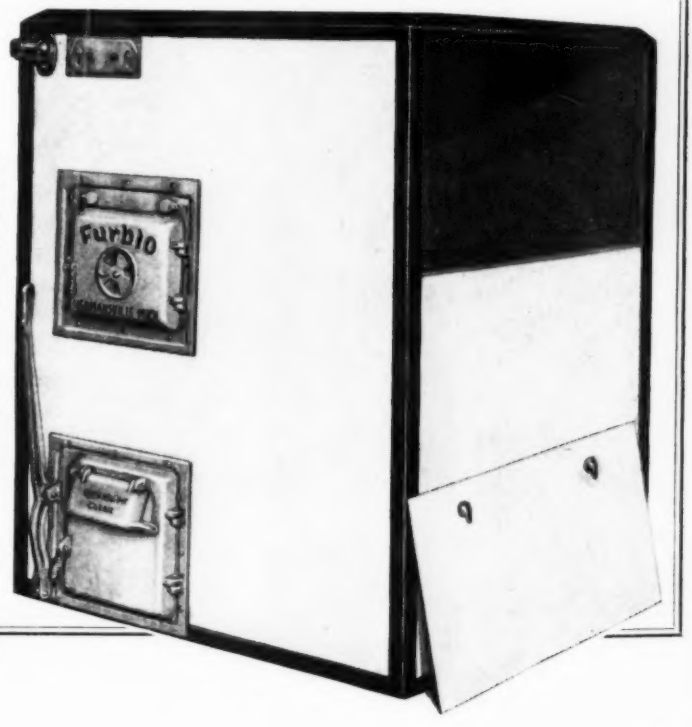
THE BARTH MANUFACTURING CO., MILLDALE, CONN., U.S.A.

Furblo WINTER AIR CONDITIONER

A great new addition to the famous Furblo *line*

Here's a chance to round out your line with a brand new "balanced" home heating unit. It's made by Furblo, known throughout the trade as builders of fine furnace blowers. The Furblo winter air conditioning unit embodies all of the knowledge we've picked up in over 19 years of serving the heating trade. It's planned and built to provide your customers with the ultimate in economy, comfort and safety in warm air heating, and as usual, Furblo engineering results in a sturdy, attractive, quality product. The large special radiator and ample heating surface assure a maximum of heat transfer to heat compartments from which it is forced to living quarters by the correctly sized blower. This quick transfer of heat offers economical fuel consumption and heating plant efficiency.

Investigate this brand new Furblo product now. We've new literature available which we'll be glad to send at your request.



FURBLO CO., HERMANSVILLE, MICH.

The Heat Pump

(Continued from Page 129

a ton if electric energy can be obtained at 1 cent a kilowatt hour. In the Tennessee Valley Authority area, electricity rates are four-tenths of a cent a kilowatt hour; in Los Angeles eight-tenths of a cent; and wherever hydro-electric power is available, rates are equally low.

In Chicago, the residential rates currently in effect are 5 cents a kilowatt hour for the first 25 k.w.h.; 3 cents for the next 75 k.w.h. and for all over 100 k.w.h., the rate is 2 cents. This 2 cent rate would govern residential heat pump installations in the Chicago area, for the average home there now uses around 90 k.w.h a month.

While it remains doubtful if the heat pump will ever compete directly with other fuels on a dollar-for-dollar basis, it is obvious that, as the cost per kilowatt of electrical energy is reduced, the heat pump becomes a stronger contender in the heating field. And the heat pump can enjoy rates lower than prevail with conventional electrical appliances.

The greatest field for the heat pump in heating and cooling entire buildings appears to be in moderate climates, where the heating load in winter approximates the cooling load in summer. This is mostly a question of economics, since it merely guarantees the full year-round operation of the heat pump. It is not necessary to balance exactly the heat gain on one side of the cycle with the heat loss on the other. But the installation so balanced would be obviously more economical when amortizing initial costs.

The choice between outside air and well water or coils buried in the ground as a primary source of "borrowed" heat depends upon the winter and summer temperatures in a given locality. Water or buried coils seem best for all except the warmest regions, for the heat pump using air is at an obvious disadvantage in cold weather. Also, the building's need for heat is greatest at the very time when available heat in the outside air is at its lowest.

◆

Jet Furnace Aircraft Heater

(Continued from Page 134)

cent less than conventional systems; selling price about $400; capable of heating a 14 by 13 foot room from 55 degrees to 90 degrees in eight minutes at designed air volume or a five room house from 55 degrees to 70 in 25 minutes.

Also described as a part of the new furnace is the use of flexible glass ducts about 3 inches in diameter. These may be "pretzeled" through the house to connect with special registers.

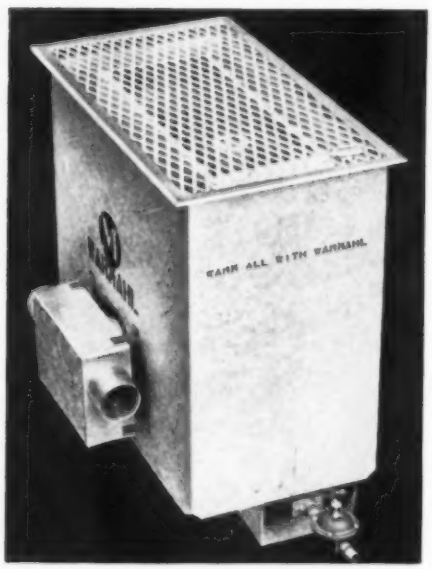
Several other small heaters of the same type were announced a year ago. No doubt exists that the trend is toward smaller furnaces—the trend is reflected even in long time standard products of old line manufacturers—how far manufacturers can carry the trend and how much of the war-time development is practical for house heating still remains to be seen.

WARMAHL

"WARM ALL WITH WARMAHL"

CLEAN THRIFTY

COMPLIES WITH INTERNATIONAL SAFETY REQUIREMENTS AMERICAN GAS ASSOCIATION APPROVED



GAS FLOOR FURNACES

WARMAHL Gas Floor Furnaces are now in production in the following capacities: 25,000 BTU—35,000 BTU and 46,000 BTU. Available for Natural Gas—Manufactured Gas—Liquefied Petroleum Gas. Can be furnished with or without automatic controls. Furnace is of heavy gage steel with Economizer burner. Double insulated rust resisting inner casing and galvanized outer casing. New Thermplate firebox and fabricated steel register with golden bronze finish.

(Dual Furnaces will be in production at later date.)

Contact Your Distributor or Write Direct for Prices and Literature

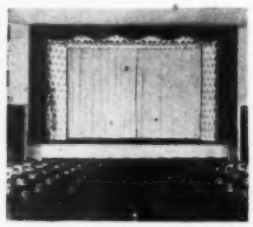
★ MANUFACTURED BY MAHL MFG. CO., 3081 EAST SLAUSON AVENUE • HUNTINGTON PARK, CALIFORNIA ★

Why Not

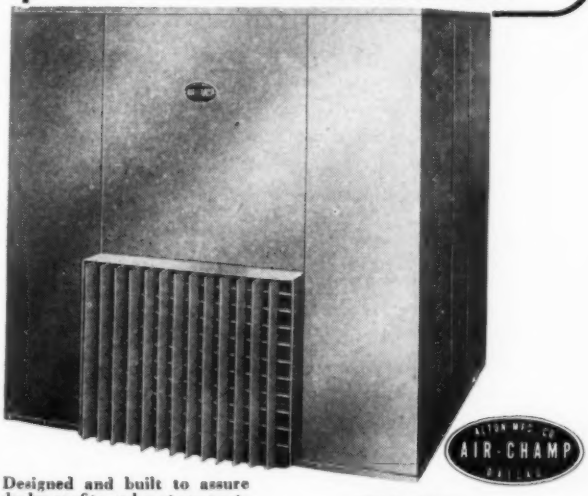
KEEP YOUR HOT-WEATHER TRADE AND PROFITS AT TOPS THIS YEAR?

The Ripley Shirt Company factory at Dallas, Texas is cooled by 4 AIR-CHAMP units installed on the roof.

Wooten's DrugStore, Aurora, Mo. is cooled by an AIR-CHAMP.



Wayne Theatre, Philadelphia, Pa., is cooled by 4 Model DM-706 AIR-CHAMP Units.



Designed and built to assure dealer profits and customer satisfaction. Capacities: 4,000 CFM to 10,000 CFM Now available for delivery.

THE AIR-CHAMP

EVAPORATIVE COOLER

DROPS AND HOLDS TEMPERATURES 10° TO 20° COOLER THAN OUTSIDE

AIR CHAMP gives low-cost comfort cooling because of these special, dependable features:

1. Original TURBO-SPRAY water assembly giving 100% wetted mats and no pump trouble.
2. 2 sets of mats. Inside eliminator mats prevents water "pull through," and excess moisture.
3. Double-life rust-proof galvanized cabinet.
4. Air Washer section separate from blower—keeps water out of blower section.
5. Quiet performance.
6. Honestly rated air capacity.
7. Clear, pure, filtered, washed air.

AIR - CHAMPS cool business establishments, theatres, offices, churches, manufacturing plants, etc., the nation-over.

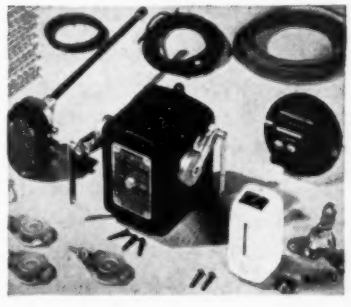
DEALERS: Write for facts about territories still open.

ALTON MANUFACTURING COMPANY
1111 CAMP STREET • DALLAS, TEXAS

Home Comfort... Coal Savings

PROVE THE DEPENDABILITY OF HEAT REGULATOR SETS

When you install an A-P Dependable Heat Regulator Set you can "forget it." Your customer needs no "signal light" to know when it operates. The comfortable temperature of his home proves it — and the savings in coal help pay for it! And it keeps on serving for many years.

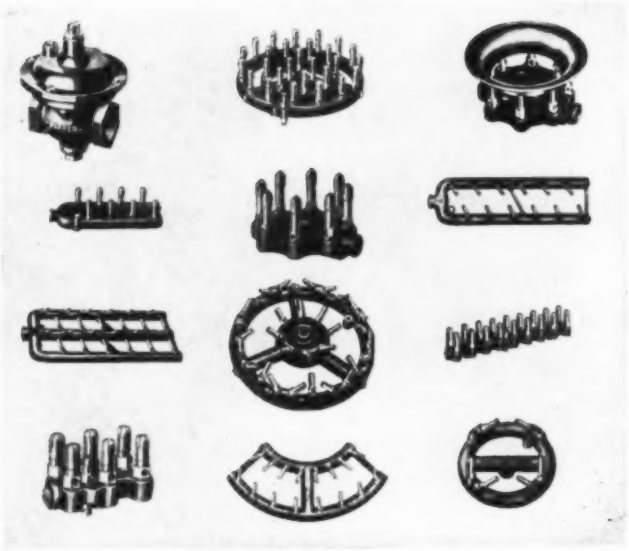


It's a complete sales package — this A-P *4-piece* Heat Regulator Set. The modern thermostat is sensitive to 1° temperature changes, operates fast and frequently for close control. The compact and powerful damper regulator has a "stoking safety" feature that users appreciate. Separate limit controls for warm air, steam, or hot water systems, avoid dangerous and wasteful overheating for extra safety and economy. Transformer is simple to attach. Complete Accessories and installation kit permits quick and easy installation.

Be sure your customers benefit by the DEPENDABILITY of an A-P Heat Regulator Set. You'll make more friends — steadier sales. Write for your complete sales kit.

AUTOMATIC PRODUCTS COMPANY
2470 NORTH THIRTY-SECOND STREET, MILWAUKEE 10, WISCONSIN

DEPENDABLE *Controls*
FOR HEATING • AIR CONDITIONING REFRIGERATION



In Any Gas Appliance a

BARBER BURNER

Is a Mark of Superior Quality

Hundreds of appliance manufacturers, some of whom have standardized for many years on Barber Burner units, have learned that a Barber-equipped appliance always sells easier and performs better. Barber makes scores of shapes and sizes of burners for all types of appliances, accurately adapting the design and the style of jets to the individual appliance and the kind of gas used. Let our engineering department work with you to develop the exact burner best suited to your purposes.

If you buy Conversion Burners, do not be confused by the avalanche of untried, experimental products now offered, or the welter of extravagant claims for them. Remember that Barber Conversion Burners—leaders in the field for twenty-five years—are available in sizes and capacities to fit the requirements of all round or oblong furnaces and boilers, and that they are to be depended on for economical, trouble-free operation.

We are gas burner specialists, and offer you our engineering and plant facilities for the development and manufacture of burner units for your specific purposes. Write for Catalog illustrating and listing many types of Burners for Appliances, Gas Conversion Burners for Furnaces and Boilers, Regulators, etc.

THE BARBER GAS BURNER CO.

3704 Superior Ave., Cleveland 14, Ohio

BARBER *Automatic* JET GAS BURNERS

Kruckman Washington Letter

(Continued from Page 111)

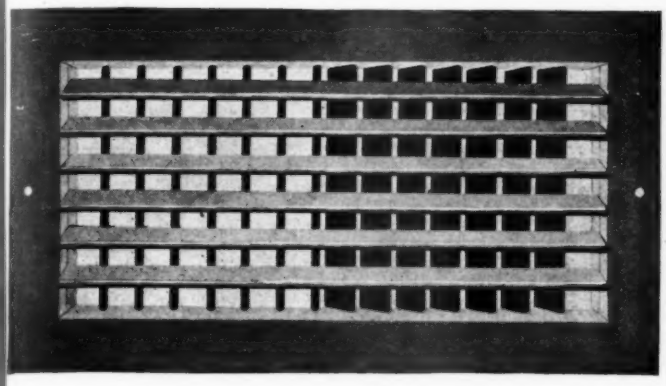
dent a bill like the Case bill will squeeze through. This type of legislation is feared because, as an omnibus bill, it opens the way for the inclusion of jokers and clauses which might really spell trouble. The NAM and U. S. Chamber of Commerce people fear that some one may put over compulsory arbitration, and do something to hurt the general flow of collective bargaining. Contrary to any general impression John L. Lewis will probably win his main objective. He is definitely expected to get the contract he wants with the coal operators. The chief result of any labor legislation may be the provision for a 60 day "cooling off" period, even, possibly, the provision of a manner by which Government arbitrators may intervene. There is much discussion about changes in the Wagner Act, and you often hear from starry-eyed persons like Senator Ball that we need a labor court. Business, however, is opposed to a labor court, and the Labor Unions do not want compulsory arbitration.

Other Problems for Congress

The main subjects apparently on the agenda for Congressional consideration aside from those already mentioned in this letter are compulsory military training; limitation of the Presidential tenure to two terms; governmental scientific research; federal grants; government reorganization; and fiscal controls over government corporations and the spending of the executive branch. There also will be more Federal Security and Public Health legislation; there will be more discussion of aids to education; more debate about housing; and particularly much discussion about Federal taxing and Federal spending. The big problem in fiscal matters will be the reorganization, by means of the new machinery provided under the Legislative Reorganization Act, which calls for a legislative budget to be submitted to Congress by the middle of February, and is supplemental to the President's budget, which is submitted early in the session. The idea of the Congressional budget is to supplant the piecemeal Congressional Action which hitherto has made the whole fiscal proceeding of the Congress almost unintelligible. Important provisions affect reappropriation of unexpended balances, the extent of permanent appropriations and the efficiency of legislative oversight of executive operations. Also there are provisions for advance decision on over-all fiscal policy; for an established form of spending proposals; for enlarged committee staffs; for post-audit reports in terms of executive performance, efficiency and need; and by clarifying specific committee authority for action on proposals to reorganize the executive branch; and to study intergovernmental relationships between the United States and the States and municipalities. Finally better opportunity for citizen participation in Federal spending by subcommittee hearings open to the public.

In his final report Small told the President that in August, 1945, the warm air furnace industry produced 30,000 units, or 35% less than the average output of 47,000 units in 1941. In October, 1946, production reached an all-time high of 90,000 units. Total requirements are 691,000 furnaces in 1946, and 806,000 units in 1947. Small reported that current production appeared sufficient to satisfy 1947 requirements. However, he pointed out that actual deliveries are retarded by shortage of fractional horsepower motors. And no real relief was in sight. Nor had the shortage of sheet steel been licked.

HIGH VELOCITY OUTLETS



HIGH VELOCITY OUTLET

Adjusted for Down Throw and to One Side

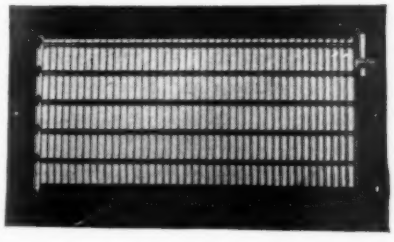
Style "DDH" illustrated above is one of eight variations of our high-velocity outlet—each bar individually adjustable with key furnished—with or without volume valves. Supplied with baked prime coat and sponge rubber gasket.

This is a heavy, attractive outlet made in all sizes, with matching fixed-bar down-deflecting return grille. Prices are competitive.

Prompt shipment of this line is available.

MANUFACTURERS OF ROOM COOLERS

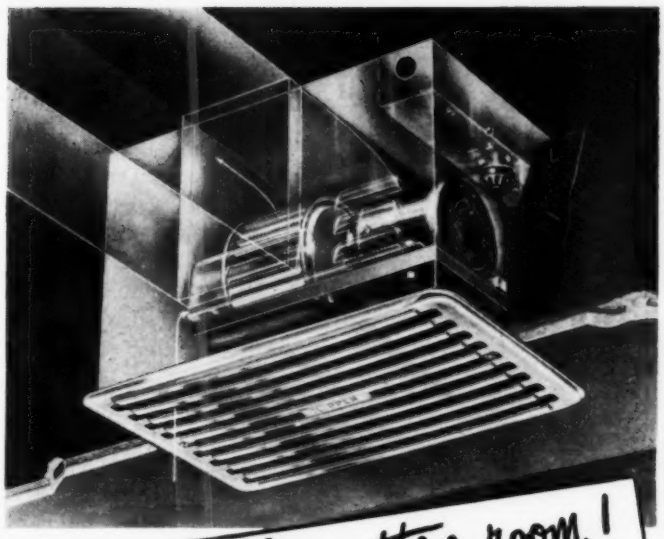
We are in a position to supply variations of the High Velocity Outlet illustrated above, curved to follow the contour of your cabinet, or straight. Your inquiry is invited for prompt, helpful information.



Style 74—Register—Wall or Baseboard. This Register utilizes 1" multiple-dampers to control volume and vertical direction. Multiple dampers may be set so as to obtain up, straight, or down deflection, as well as complete shut-off. The face is the same as all others of the "70" line—permitting air reflection right or left by adjusting front blades with key furnished. Blades are ¼" center to center, and ¼" in depth. Complete with rubber gasket, screw holes, prime coat. This is an attractive, well-constructed register, available promptly.

For immediate quotation and literature,
Ask for Bulletin A-1.

STEWART MANUFACTURING COMPANY
INCORPORATED
BLOOMFIELD, N. J.



for the forgotten room!

a proven source of extra profit with these patented

CLIPPER BLOWERS

KITCHENS, bathrooms, ticket booths, X-ray rooms, toilets, clinics and numerous others are the forgotten rooms of every building. *They badly need ventilation* and Clipper Ceiling Blowers are specifically designed to do the job better—at a good profit to you.

Clipper Blowers are mounted between ceiling joists and vented outside. They trap and expel unwanted air, heat and odors the instant they rise.

The Clipper is NOT a blade-type fan, but a quiet squirrel cage blower—a complete packaged unit—that moves a volume of air under pressure. Its patented construction with the motor entirely removed from the air stream, means greater efficiency, longer life, easier servicing.

Ask your jobber for details of the Clipper Sales Plan or write us for complete information.

Only an inconspicuous "dripless" ceiling grille is visible, yet motor and blower assembly are instantly removed without tools for service.

TRADE-WIND MOTORFANS, INC.
5725 S. Main Street • Los Angeles 37, California

Industry Must Maintain Jurisdiction

(Continued from Page 120)

recognizes this and the contractor doesn't recognize it, labor should wise him up to current decisions in our favor.

Because possibly, in his location, ventilation has not been of a paramount nature or he may have been doing gutter work and furnace work and light manufacturing and so on, he shouldn't give away our industry's rights. So I think our labor people, who are more cognizant of events, such as this body of representatives is and can, through the International, get these decisions and bring same to the attention of these contractors who seem not to know the fundamental distinctions and the rights granted us by the American Federation of Labor in our charter.

With collective bargaining you make labor relations. Labor relations should be based upon understanding, not confusion. It seems to me, as I have said, that we are sufficiently able to sit with our employees and to discuss our problems around the council table and come to a conclusion without an outsider in our midst. I think that we will get along better from now on, if our people will do, as we did, before government stepped into our relations.

The National Association was brought closer to being by our good friend, President Byron, who during the war years tried to protect your jurisdiction in Washington. He learned that he was alone in the Capitol, that trades like the pipe fitters and the plumbers had strong national associations and were able to get jurisdictions and awards on work. So, he urged our people throughout the United States to form an association of our contractors.

I would like all the representatives here to understand what is being done, and to take what I have told you today back to your home districts. Fellows, go to work promoting the idea of our Labor Relations Programs, so we can all work together in harmony to promote the welfare of every one of us, management and labor working together in mutual trust for the public interest.

◆

Payroll Tax Disqualifications

(Continued from Page 109)

36. Cause must be attributable to employer. All wage credits earned in such employment are cancelled.
37. Unless claimant has medical certificate that she is able to work.
38. Cause must be attributable to employer. Employer's account not charged. Total benefits are reduced if no return to work in covered employment within benefit year.
39. Need not be "connected with work". Employer's account not charged. Total benefits reduced if no return to work in covered employment within benefit year.
40. Plus such additional period as offer of suitable work continues open. Employer's account not charged. Total benefits reduced if no return to covered employment within benefit year.
41. No disqualification if employees are required to accept wages, hours or conditions of employment less favorable than prevailing in community or if denied right of collective bargaining or if employer shuts plant or dismisses employees to force reduction or change in working conditions.
42. Not disqualified if leaves (1) for good cause attributable to employer, (2) for compelling personal reason, or (3) to take another job at which he stays for at least 7 weeks. If disqualified, no benefits whatever based on wage credits earned with employer so left and (as to other employers) no benefits for week of leaving and next 4 weeks.
43. All wages credits earned with such employer cancelled. Disqualified also (as to other employers) for week of discharge and three following weeks.

REVOLUTIONARY

THE NEW SCIENTIFIC . . . . AGA CERTIFIED

JACKSON GAS BURNER

- FOR 5 ROOMS OR 20 ROOM HOUSE
- CAST IRON CONSTRUCTION GOOD FOR A LIFETIME
- RESULT OF 20 YEARS EXPERIENCE
- MOTOR DRIVEN (Not gravity)
- DOUBLE SAFETY FEATURES. A SAFETY PILOT AND SAIL SWITCH
- EVERY BURNER TRIED AND TESTED THOROUGHLY

COMPACT
EFFICIENT
ECONOMICAL

INTERESTED DEALERS
WRITE FOR INFORMATION
8781 QUINCY, DETROIT 4

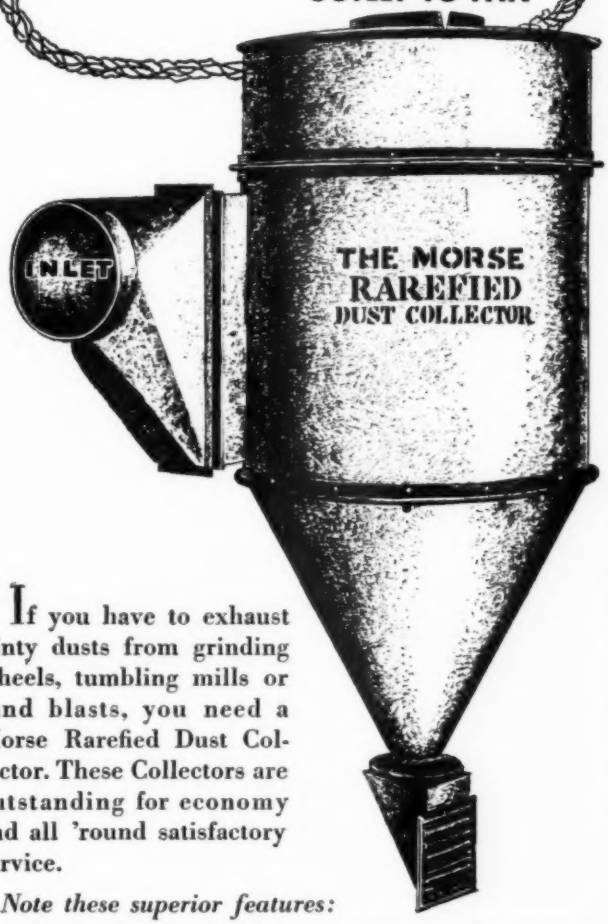
JACKSON·GAS·BURNER·CORP.

FOR EXHAUSTING FLINTY DUSTS

MORSE RAREFIED DUST COLLECTORS

DO A BETTER JOB

OUTLET TO FAN



If you have to exhaust flinty dusts from grinding wheels, tumbling mills or sand blasts, you need a Morse Rarefied Dust Collector. These Collectors are outstanding for economy and all 'round satisfactory service.

Note these superior features:

1. No abrasive material gets through to the fan.
2. There is a constant air flow at hood inlet.
3. No moving parts.
4. No cloths or screens to to clog and require expensive maintenance or replacement.
5. Collected material is discharged automatically to storage bin.
6. No undue wear on collector parts.

Write or phone for complete information on these superior collectors. A Goergen-Mackwirth engineer will gladly survey your problem and submit recommendations.

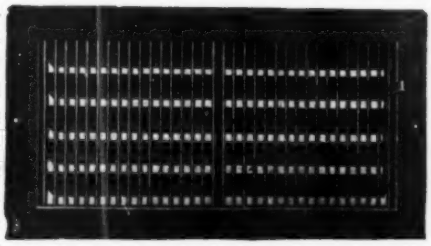
Goergen-Mackwirth
COMPANY, INC.
817 SYCAMORE STREET, BUFFALO 12, N. Y., Phone: Cleveland 6661
SPECIALISTS IN THE MOVEMENT AND CONTROL OF AIR

Air-Vane Registers

Intakes and Grilles

STYLE - EFFICIENCY - PROVEN QUALITY

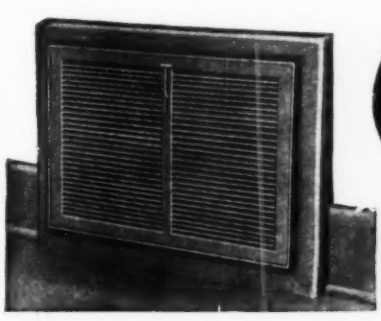
Air-Vane registers constructed with vertical or horizontal Vanes for right or left or downward Deflection of Air flow. Multi-louvre dampers for closing and 15 degree downward directional air flow standard. Also available with single louvre in Wall and Baseboard registers. Grilles and Intakes in all standard Warm Air pipe sizes. Large and Special sizes furnished promptly.



No. 802 AIR-VANE Forced Air Register

BENDA-VANE REGISTERS

Benda-Vane Registers are made in Single Valve and Multi-Louvre types. Available in sizes for all standard Forced Air and Gravity Size Registers.



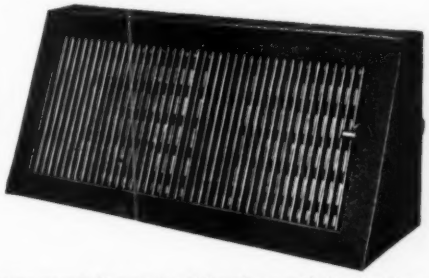
Inset above shows simple adjustment of vanes with special tool furnished.

NO. 200 SERIES—No-Streak Bar Design.
First Floor One Way

NO STREAK and OUT-O-WALL REGISTERS

For Gravity Lines. Available in standard sizes; also in narrow floor projections for second floor stacks; also Forced Air Sizes.

The Popular Out-O-Wall With New Face



Especially adapted to remodeling work and for places with double joists, sills or masonry walls where you cannot cut in the ordinary baseboard register. You save 90% on labor and improve your job when you use Out-O-Wall registers and intakes.

Write today for a copy of our complete catalogue giving full information on our extensive line of Registers and Ventilating Grilles.

Rock Island Register Co.
ROCK ISLAND ILLINOIS

WANTED

DISTRIBUTORS AND DEALERS

FOR

HAYWARD

CONVERSION GAS BURNERS

IMMEDIATE DELIVERY

FOR INFORMATION AND PRICES

WRITE

C. A. HAYWARD MFG. CO.

ALGONAC, MICHIGAN

A A's Summary of 1946— A A's Guess for 1947

(Continued from Page 103)

is adding up at least twice as fast as orders are being filled. The same scarcities as beset all other producers of heating equipment have overtaken the oil burner manufacturers.

Stokers

Factory sales of mechanical coal stokers totaled 18,640 units of all sizes and types in October, 1946. In the same month of 1945 19,958 units were sold. Stoker sales for the January-October period, 1946 totaled 165,895 units as compared with 94,913 units in the same period of 1945. In 1941 —the largest year in stoker sales—the sale in January-October period was 172,978 machines.

Sales of stokers for residential use (under 61 pounds per hour) for the January-October, 1946 period were 148,764 machines.

Based upon these figures, it seems the stoker industry is doing a good job of producing to meet demand since no siza-

(Continued on Page 244)

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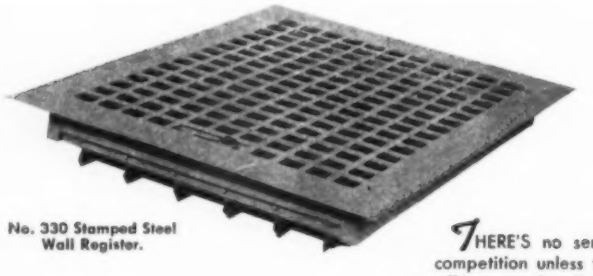


No. 330 Stamped Steel Wall Register.

A-J Registers and Grilles

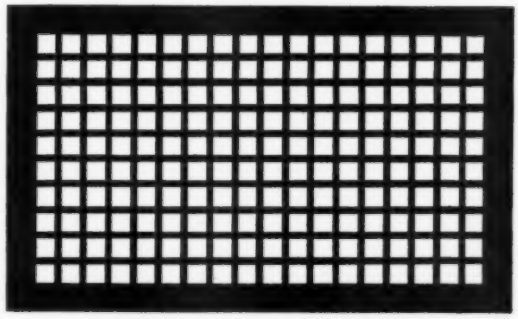
THERE'S no sense trying to meet competition unless you're prepared to offer a complete line of registers, grilles and air diffusers.

A-J *is a complete* line, offering the finest in air outlets to perform under the most exacting conditions and to harmonize perfectly with the latest architectural designs. Grilles are available in plain lattice, slotted, or many ornamental faces; registers in wall, ceiling or floor type with fixed or adjustable deflections, and horizontal louvers if desired.

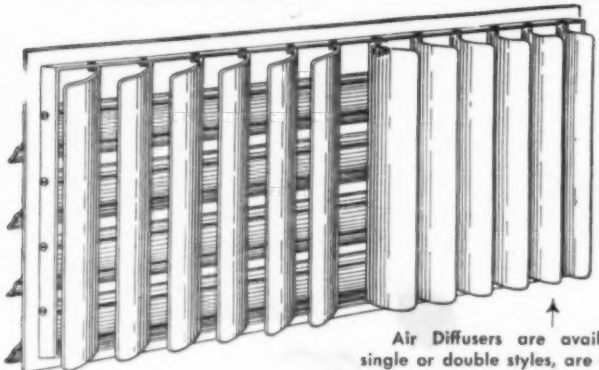
More complete details are available by simply dropping us a postcard requesting a catalog. *Please do it today.*

A-J MANUFACTURING COMPANY

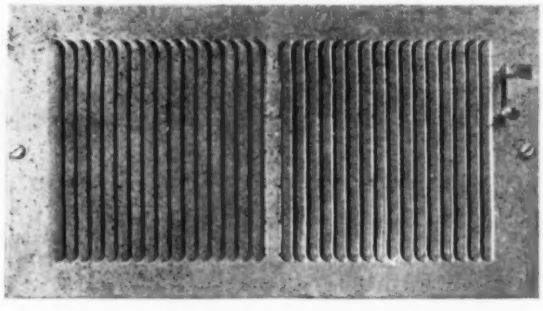
2119 WASHINGTON ST. KANSAS CITY 8, MO.



Plain Lattice Design. Available in No. 16, No. 14, No. 12 and No. 10 U. S. Standard gauge.

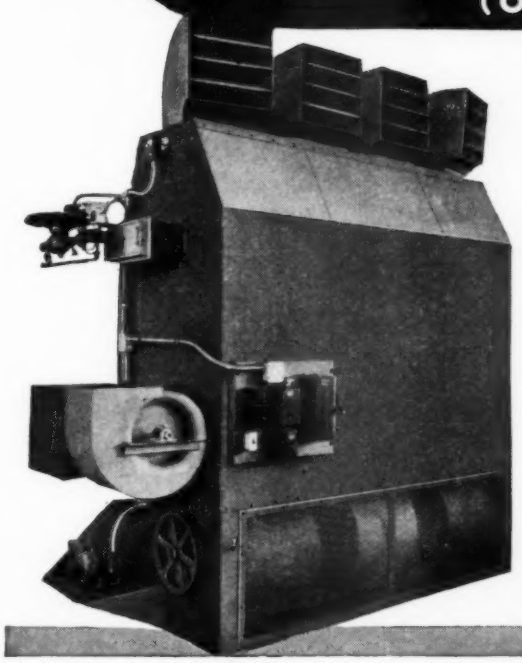


Directional Flow Register No. 10 Series for Forced Air Installations.



Air Diffusers are available in either single or double styles, are fully adjustable and may be held in any position by our tested method of screw attachment.

More Efficient Heating With
AIRTHERM Direct-Fired Warm Air Heater
(Oil or Gas Fired)



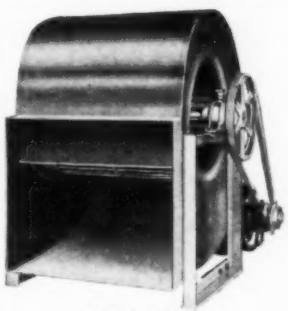
Direct heat transfer through a single thickness of metal results in the high efficiency and low operating cost of the Airtherm Direct-Fired Warm Air Heater. The Airtherm is a self-contained heating system — ready to connect to your fuel and power supply lines.

Capacities from 650,000 to 1,950,000 B.T.U.'s. Either oil or gas-fired.

✓ *Write for Bulletin 801 describing this economical heater in detail.*

AIRTHERM
MANUFACTURING COMPANY
AT-43

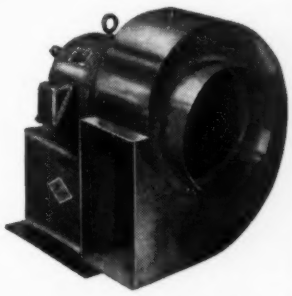
706 So. Spring Ave. • St. Louis 10, Mo.



"B" Assembly Belt Drive

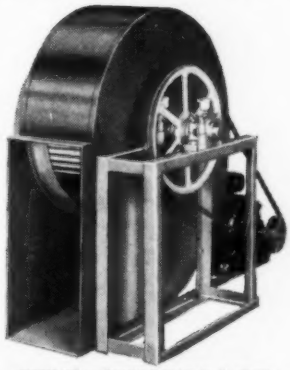
Properaire

BLOWERS
Easily Adapted
High Quality Equipment
at Reasonable Cost



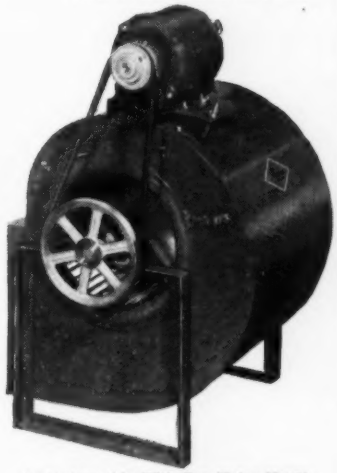
TYPE E—Direct Drive; in 5 sizes

SERIES 2000—Package Units



TYPE EB—Single Inlet; in 3 sizes

FURNACE MANUFACTURERS AND JOBBERS
Write for
Complete Descriptive Folder



"B" Assembly With Top Motor Mount

GRAND RAPIDS DIE & TOOL CO. • **1519 Madison Avenue S. E. GRAND RAPIDS 7, MICHIGAN**

Speed Up Orders With a

BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER—accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

BEVERLY SHEAR MFG. CO.
3004 W. 111th St., Dept. 5 Chicago 43, Ill.

ble backlog of orders has been reported.

Roofing

Information available in the fourth quarter points to a near-record production of some 70 million squares of asphalt roofing materials of all types in 1946. Only once previously has this figure been reached. Productive capacity is said to be increasing slowly, so 1947 ought to be somewhat better than 1946.

◆

Waterbury's Methods For Aluminum Ducts

(Continued from Page 127)

Waterbury's practice calls for splitter dampers at openings of branches into main plus volume dampers in the first straight section of the branch for volume control. In addition, a damper is placed in each return box so that return volume from each room can be adjusted. All these dampers in aluminum ducts or tin plate stacks are aluminum.

Almost no aluminum duct systems are painted. Though no extra selling effort is needed to convince owners aluminum is a satisfactory material, Waterbury charges $2.50 more per opening for aluminum than for galvanized. This extra charge for aluminum seems to convince the most skeptical customer that aluminum is a premium material.

Minneapolis has long been a community with a preference for gas. To provide protection against acid condensation, aluminum flue liners and aluminum flues are standard practice. Waterbury also fabricates and installs aluminum condensation Tees in the smoke pipe.

At Last A Perfectly Designed "Packaged" Coal

FURNACE FOR LOW COST HOMES
THE KEHM FREE-AIR HEATER

The new Kehm Free-Aire Heater fills a long felt need for a miniature furnace perfectly designed for small basement and no-basement homes—90% of your new construction market to-day. Can be used in a wide variety of approved "Free Aire" duct designs to save labor, materials and money. Can also be used for small gravity full duct installations, furnace replacements and many types of pipeless furnace applications and short duct extensions.

18″ propeller type fan—any speed up to 600 C.F.M.—holds large supply of coal—18″ brick refractory firepot—tubular cast iron construction—1/40 H.P. MOTOR—removable ash pan—supply and return openings—85,000 B.T.U. output—70% efficiency. Low fuel cost.

Dealers and Furnace jobbers. Write at once for complete information and low price.

THE KEHM CORPORATION
135 So. LaSalle St. - Chicago
Over 50 Years in Heating

Beautiful Brown Baked Enamel Finish—Size 24 x 24 x 50

Over a third of a Century FAITHFUL PERFORMANCE

KRESKY offers future profits to DEALERS

A pioneer among oil burners Kresky finds such an unprecedented demand today that we are forced to limit shipments to old established dealers. Nevertheless new franchises are being granted now to farsighted dealers who see in Kresky's present oversold condition the promise of future opportunity. ★ The versatile Kresky line is a year round money maker due to its wide applications – heating, cooking and industrial. It includes Conversion Burners, Floor Furnaces, Forced Air Units, Range Burners and Water Heaters. *Write for Kresky Dealer Plan.*

Kresky Oil BURNERS

KRESKY MANUFACTURING COMPANY

Pioneers in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA

HEATING • COOKING • HOT WATER • INDUSTRIAL

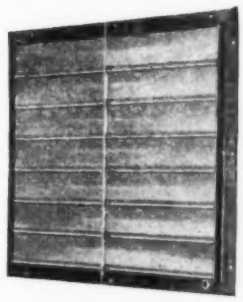
Elgo Ventilating Specialties

WORLD-FAMOUS AUTOMATIC SHUTTERS

Louvres weatherstripped on inner edge, instead of on outer edge, making the unit the tightest closing shutter on the market.

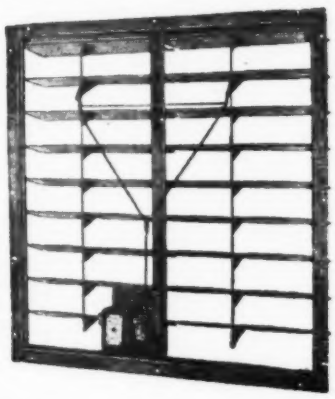
Swivel-joint with special shoulder rivet. No wear or rattle. Good for the life of the shutter.

More sensitive than any other automatic shutter, and longer lasting. Sizes from 8" to 72" square—also rectangular.



"ELGO" TYPE AUTOMATIC SHUTTER
Front View (Closed)

All-Steel Motorized Shutter



Used for exhaust ventilation in industrial, commercial and residential buildings. Automatically controlled by fan switch. Six-second opening. Positive closing. Storm-proof. All-steel construction.

Elgo Shutter & Manufacturing Co.
6966 W. JEFFERSON DETROIT 17, MICH.

ELGO
Always the Leader

Elgo Shutters Are Distributed Through Fan and Air Conditioning Equipment Manufacturers

Elgo Shutter & Mfg. Co.
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Detroit 17, Michigan

Free CATALOG

Please send catalog showing the items checked below:

- Automatic Shutters
- Stationary Shutters
- Hand Operated Shutters
- Ceiling Dampers
- Balanced Vent Units
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Name.....
Address.....
City..... State.....

HERE'S A TANK GAUGE
THAT WILL ACCOMMODATE ALL TANKS

Check these features and you will see why *Bearlee* gauges are better:

1. Because they are adjustable for all tanks from 18" to 28" and 30" to 48" in depth.
2. The combination threaded aluminum plug fits 1½" and 2" tank openings (no bushings to use).
3. Gas tight construction; Flint Glass Screwed in aluminum plug; easy to read from any direction in dark places.
4. One-piece adjustable indicator rod. No other gauge can offer this feature. When you set the BEARLEE gauge, you know you have a perfect reading for the contents of every tank.
5. Every adjustable and exclusive feature cannot be offered in any other gauge.

All that's new and better you will find in the BEARLEE gauges, and you can have them at competitive prices.

Distributors and dealers write today for quotations.

BEARLEE PRODUCTS CO.
GREEN BAY — WISCONSIN

Cronstrom Methods For Aluminum Ducts

(Continued from Page 125)

or metal. The aluminum foil is readily pushed between the joists and up against the floor and is then stapled in place with a hand stapler. The bottom of the return run is closed by stapling the foil to the bottom of the joists. To facilitate handling, the foil is bought 16 inches wide for single joist space runs and 32 inches wide for double runs. The foil is bought in a coil of one hundred feet and a coil is delivered to the job where a continuous length is cut off for each return run. Thus there are no seams.

Finishing

Quite a sales point can be made, reports Cronstrom, of aluminum's appearance. Painting of the basement ductwork is not necessary—in fact most customers request that the aluminum be left bare. The appearance is not shiny or "tinny," but a soft sheen-like reflective surface which definitely improves the appearance of the heating plant throughout the basement.

Where painting is required—as for instance furnace or blower cabinets or signs—one prime coat and one finish coat, both spray applied and air dried give the desired effect.

Cronstrom reports that his entire organization and the builders and owners he serves all like aluminum—whether or not he returns to the use of galvanized iron for residential duct work is problematical. Cronstrom is also using aluminum on some outside sheet metal work—flashings of all kinds; outside vents; canopies and outside door coverings instead of stainless steel; Cronstrom is considering the use of aluminum for gutters and skylights. For all such work spot welding will be used instead of riveting to speed up fabrication.

The Most Complete Line of GAS CONVERSION BURNERS

★

REINHARD
GAS CONVERSION BURNERS
(Since 1932)

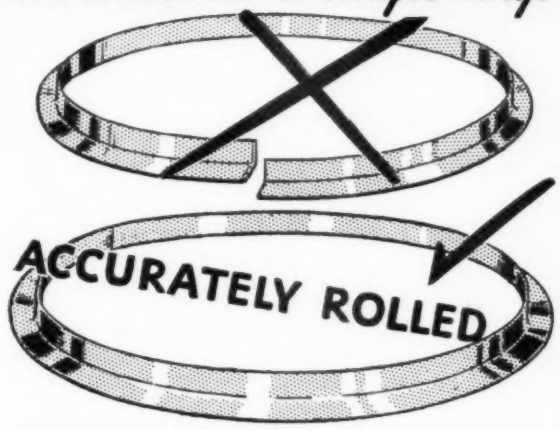
★ Industrial
★ Commercial
★ Domestic
★ Coal and Wood Cook Stoves
★ Coal and Wood Heating Stoves
★ General Utility Burners

See Our New 1947 Model* Domestic Burner at the Cleveland Show · Booth 867

*Certified by American Gas Association

Quality Products for Over 45 Years
REINHARD BROTHERS CO.
11 SOUTH 9th STREET MINNEAPOLIS 2, MINNESOTA

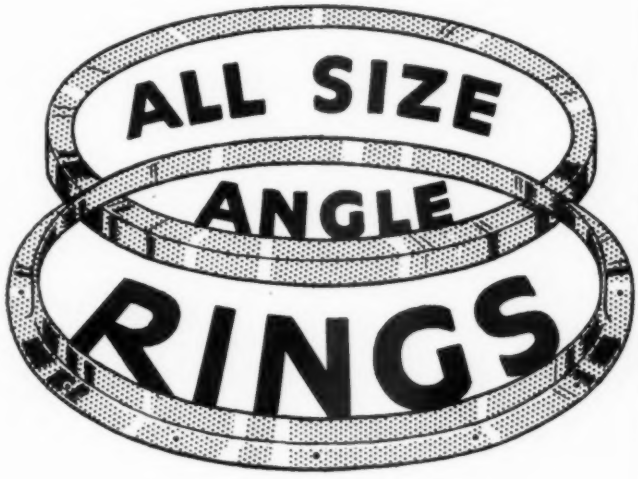
Our Business is Angle Rings



When it comes to rolling rings that join up naturally—with uniform curvature thruout we can be of genuine service to you.

Saves time and effort when you back them up or fit them in on the job. Made to fit your needs—complete circles or any part thereof.

Use them for reinforcing tanks—joining pipe or smoke stacks—installing wall fans and many other uses.



We Roll Thousands

EVERY DAY we roll more, to your specification—large or small, accurate in every dimension, furnished with or without bolt or rivet holes.

Write for list of sizes and discounts.

Has thousands of uses and applications in reinforcing and joining in all types of construction work.

We fabricate to order channels, special shapes and all types of sheet metal work.

Write TODAY to

NATIONAL METAL FABRICATORS

2136 S. Sawyer Ave. - - Chicago 23, Illinois

NOW

THE AMAZING NEW

ARCTIC CIRCLE

The Nation's Finest

EVAPORATIVE COOLER

Arctic Circle Evaporative Coolers have *every desirable feature* . . . are definitely superior in appearance and performance!

- Constructed of heavy rust-resisting galvanized steel
- Completely die pressed and welded
- All steel treated for rust prevention
- Dynamically and statistically balanced oversize blower. Larger than other coolers of comparable size
- Suspended blower, eliminating obstructions in bottom pan
- Equipped with quiet running Westinghouse motor
- Bronze water meter gives *even water distribution* to all pads
- Extra large non-sag pads
- Special chemically treated pads absorb water 30 times faster
- Finished in blue-grey hammered baked enamel inside and out

ARCTIC CIRCLE COOLER

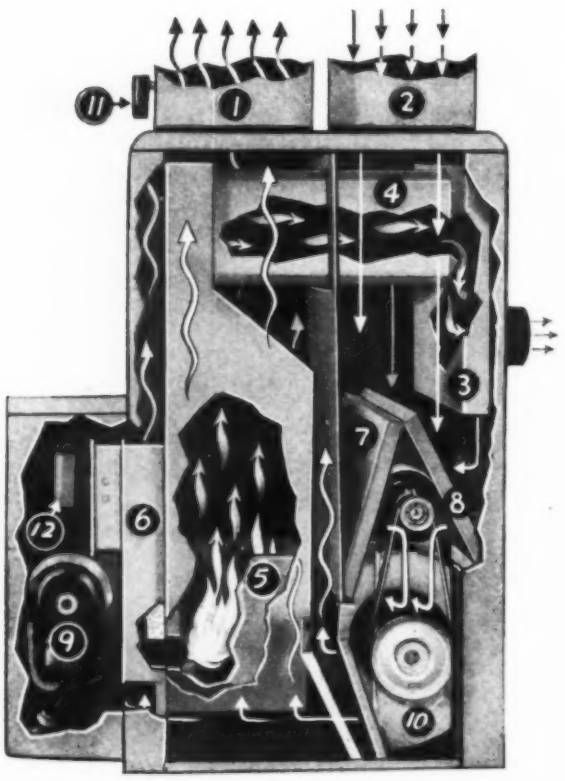
INTERNATIONAL

METAL PRODUCTS CO.

P. O. BOX 1712 • 500 S. 15th STREET
PHOENIX, ARIZONA

SUN

FUEL-MASTER



OIL FURNACES

SUN Automatic Oil Furnaces are now available in limited volume. Re-designed, better than ever . . . sizes 100 - 135 - 165 - 200 thousand B.t.u. per hr.

J·V·PATTEN COMPANY

MANUFACTURERS — ENGINEERS

SYCAMORE, ILLINOIS

New Apprentice Standards of SMWIA.

(Continued from Page 118)

26. Expenses Incurred in Administration of these Standards. Expenses incurred by the Joint Sheet Metal Apprenticeship Committee in carrying out the provisions of these standards will be borne equally by the Contractors Associations and the Union.

EXISTING RULES AND REGULATIONS OF THE JOINT SHEET METAL APPRENTICESHIP COMMITTEE:

1. All applications of employers for an apprentice shall be submitted to the local Joint Sheet Metal Apprenticeship Committee.

2. You must state why you desire to employ an apprentice.

3. You must have employed four or more journeymen sheet metal workers for a period of 39 full weeks or more or an individual total of 1560 or more hours each during the past year.

4. You must give reasonable assurance that you will have sufficient work to keep both the apprentice and the proper ratio of journeymen sheet metal workers employed a minimum of 39 full weeks per year.

5. You must have been in business as a master sheet metal contractor for one or more years.

6. You may be required to appear before the Local Sheet Metal Apprenticeship Committee at intervals to keep the

PLANNED SERVICE

pays 3 WAYS

The Grand Rapids Furnace Cleaner increases your profits by enabling you to merchandise through your service department. While you make money on the cleaning you make an additional amount by selling new equipment and repair jobs. This planned service pays in a third way, too, for it saves vital fuel by keeping your customers' furnaces operating efficiently.

The sturdy Grand Rapids Furnace Cleaner is soundly engineered to give years of satisfying service. It cleans thoroughly, sucking out all dirt and dust, eliminating "plug up" conditions. Quickly cleans furnaces, boilers, chimneys, stokers, oil burners, heaters — or the entire basement. Write for complete details.

GRAND RAPIDS FURNACE CLEANER

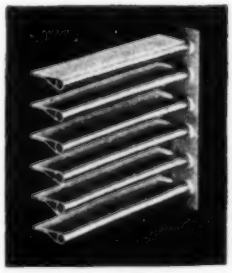
MODEL OF *The Doyle* VAC-IT

DOYLE VACUUM CLEANER CO., 227 Stevens St., S. W., Grand Rapids 7, Mich.

EXCLUSIVE GRILLE DESIGN *gives*

POSITIVE "4 WAY" AIR STREAM DIRECTIONAL CONTROL..

Specify WATERLOO Registers



Waterloo streamlined grille Louvres exclusively designed for greater air stream control.

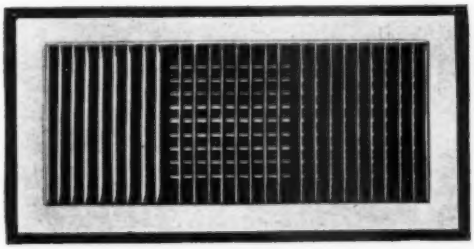
These great advantages assure complete air stream diffusion from air conditioning outlets.

★ 2 series of Louvres—one set behind the other—give positive 4 way diffusion.

★ Louvres with exclusive Waterloo streamlined design have more control over air stream, cut down noise—have greater strength.

★ Each Louvre individually adjustable—so that whatever the size or shape of room these louvres can be turned to diffuse air into every part.

★ Designed with beauty that blends perfectly into desired motif. Bonderized—then spray coated with grey lacquer finish.



Waterloo Air Diffusion Grille Type FG-80 showing the 2 banks of louvres which give complete air stream diffusion.

Write for Free Catalogue—gives complete information.

WATERLOO REGISTER SALES CO.

WATERLOO **Dept. A147** **IOWA**

ILLBRONZE BRAND

BRONZE POWDERS, PASTE *and* CHROME PAINTS

"Dress Up" Sales Appeal for Products in METAL, WOOD, PLASTIC, PAPER

Used by craftsmen all over the world! Metallic finishes in many special shades and various textures! The kind of quality that means you can look to Illbronze with complete confidence for your needs at low costs! Fine Pale, Rich and Deep Gold Lining Powder, Silver Fixture and Butler Silver, Copper and Aluminum Powders and Paste, Special "quick-drying" Chrome Finish paint, R.M. Aluminum Lacquer and Lacquer Thinner. Inquire for lowest prices, and samples if desired.

ILLINOIS BRONZE POWDER CO., Inc.

Dept. AA, 2023 S. Clark Street, Chicago 16

Committee informed as to the apprentice's progress, conduct, interest, schooling and so forth.

7. You will be required to carry out the intent and purpose of the Apprenticeship Standards for the sheet metal trade, governing the serving of an apprenticeship and school attendance pertaining to the employment of an apprentice.

8. The Local Joint Sheet Metal Apprenticeship Committee may reject the apprenticeship application of any master sheet metal worker, firm, partnership, company or corporation against whom an unsatisfied judgment, lien, wage claim or receivership is pending, until said committee is satisfied that proper disposition has been made thereof.

9. The Joint Apprenticeship Committee recommends that you, as the employer, carry compensation and liability insurance.

Report of the Apprenticeship Committee to the 27th General Convention of The Sheet Metal Workers' International Association, held in Chicago, Illinois, November 11 to 16, 1946:

This Committee recommends that Article 9, Section 4 of the Standard form of Union Agreement, which reads as follows:

Section 4: All applicants for apprenticeship shall be between the ages of 16 and 21 years of age, and each registered apprentice shall serve an apprenticeship of four (4) years, and such apprentice shall not be put in charge of work on any job and shall work under the supervision of a journeyman until apprenticeship term has been completed and they have qualified as journeymen.

This Committee recommends that Article 9, Section 4, be revised to read as follows:

Section 4: All applicants for apprenticeship shall be between the ages of 16 and 21 years of age, and each reg-

POLO

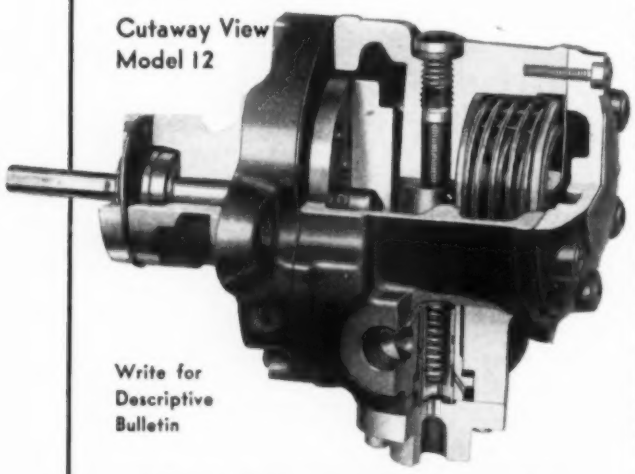
FORMERLY "RYSTROM"

OIL BURNER FUEL PUMPS

NEW IDEAS!
NEW FEATURES!
EASY TO INSTALL...
EASY TO SERVICE...
IDEAL FOR REPLACEMENT

POLO (formerly "Rystrom") PUMPS are designed and built to reduce the troubles commonly encountered by dealers and their service men. For example, the entire pump can be disassembled, if necessary, with only two tools—a screw driver and a set-screw wrench. For another example, the valve assembly can be quickly removed with a screw driver and the fingers . . . there are no press fits. The strainer consists of four concentric cylinders of fine-mesh monel screen, made up in a cartridge form that is easy to remove and easy to clean. Piping is simple, with all connections brought out to convenient locations. With adapter flanges, POLO PUMPS are ideal as reliable replacement units for the majority of existing burners. You get Performance *Plus* with POLO PUMPS.

Cutaway View
Model 12



Write for Descriptive Bulletin

POLO PUMP CO.

Formerly Rystrom Engineering Company

POLO, ILLINOIS

REPUTATION and PROVED PERFORMANCE Sell GEHL STOKERS

AGAIN
"Stoker Sales are blowing a Gehl"

Gehl Stokers have won buyer confidence over a period of many years . . . for their outstanding performance . . . for unfailing dependability. In a Gehl, you get engineering by *experienced stoker specialists* . . . progressive engineering that keeps step with new improvements, all backed by an 80-year-old company.

In a Gehl you get many features that mean customer satisfaction—heavy, all-cast, rust-resisting chassis . . . barometric automatic control of chimney draft . . . unit air and coal feed tube that assures even distribution of air in the fire bed . . . an auto-type transmission . . . a retort that assures efficient combustion.

Domestic and Industrial model now available.

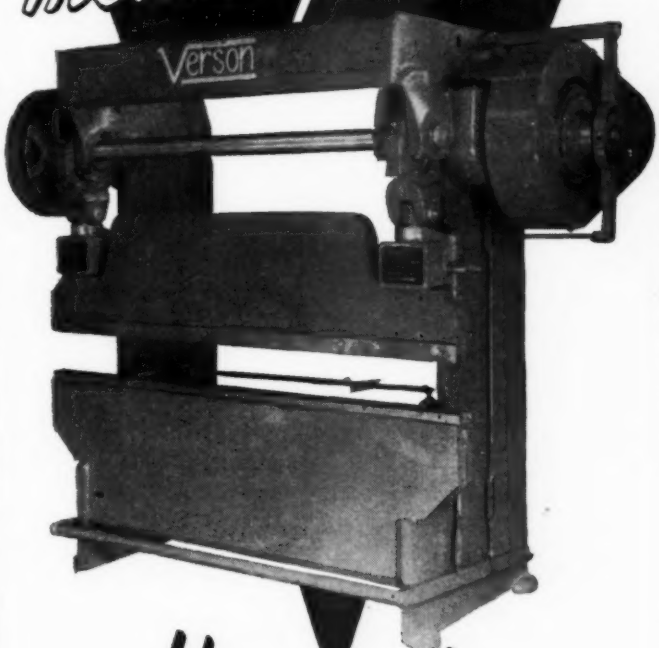
Write today for literature and details of the Gehl dealer program.

GEHL BROS. MFG. CO.

Dept. BA 800 Established 1867 West Bend, Wis.

A GEHL WINS FRIENDS WHEREVER IT GOES

a Verson JUNIOR PRESS BRAKE CAN *Increase Your Profits*



Here's How

• A Verson Junior Press Brake in your shop enables you to handle more work. It gives you the added speed, versatility and job quality of a big brake—but, at small machine economy. Verson Junior Brakes are built in a range of sizes from which you can choose the exact unit for your requirements. Complete tooling for forming, bending and punching is available.

Send for details . . .
or if it is a special problem
ask to see a Verson engineer.

VERSON ALLSTEEL PRESS CO.
9302-A So. Kenwood Avenue, CHICAGO 19, ILLINOIS

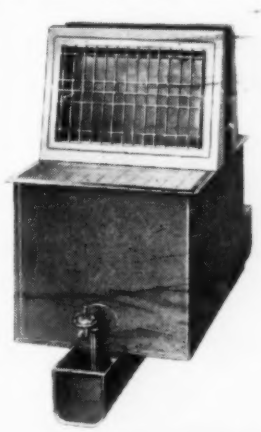
THE ONLY "DUAL" YOU CAN EASILY INSTALL FROM ABOVE THE FLOOR

HOLLY *Stubby*

FOR THE FIRST TIME you can install a dual floor furnace *from above* the floor by merely cutting the hole to the exact furnace size—in either new construction or for remodeling. Then slip the STUBBY into place from above the floor.

Holly's many patented features make this possible. For example the removable, watertight burner pan contains all operating units and is easily installed or removed for service.

The Holly STUBBY completely eliminates the cutting of a trap door, cutting floor holes oversize, patching floors and walls, building a pit and dragging a furnace *under* the house for installation.



STUBBY'S installation advantage is but one of 7 big Holly features that make this furnace *easier for you to make more money.*

Holly STUBBY
Dual floor furnace

HOLLY MANUFACTURING COMPANY
875 SOUTH ARROYO PARKWAY, PASADENA 5, CALIF.

THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of muss or fuss.

And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A. G. A. standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.

GAS BARNES Better Bilt FURNACES

For further information on the Barnes Better Bilt Gas Floor Furnace write today

BARNES HEATING & VENTILATING CO.
SALES OFFICE 330 E. FOURTH ST., LONG BEACH 2, CALIFORNIA

istered apprentice shall serve an apprenticeship of *not less than* four (4) years, and such apprentice shall not be put in charge of work on any job and shall work under the supervision of a journeyman until apprenticeship term has been completed and they have qualified as journeymen.

Also, this Committee recommends that Article 9, Section 5, of the Standard form of Union agreement, which reads as follows:

Section 5: A graduated wage scale for apprentices shall be established and maintained on the following percentage basis of the established wage rate of Journeymen Sheet Metal Workers:

First year —first half 35%; second half 40%
Second year—first half 45%; second half 50%
Third year —first half 55%; second half 60%
Fourth year—first half 70%; second half 80%

This Committee recommends that Article 9, Section 5, be revised to read as follows:

Section 5: A graduated wage scale for apprentices shall be established and maintained on the following percentage basis of the established wage rate of Journeymen Sheet Metal Workers:

First year —first half 40%; second half 45%
Second year—first half 50%; second half 55%
Third year —first half 60%; second half 65%
Fourth year—first half 70%; second half 80%

This Committee further recommends that the International Association use every endeavor to assist in bringing the apprenticeship standards into every available locality within the jurisdiction of the International Association; and that they assist in setting up a Joint Apprenticeship Committee.

"Made-Rite"

DUCTS
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SMOKE PIPE
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FURNACE PIPE
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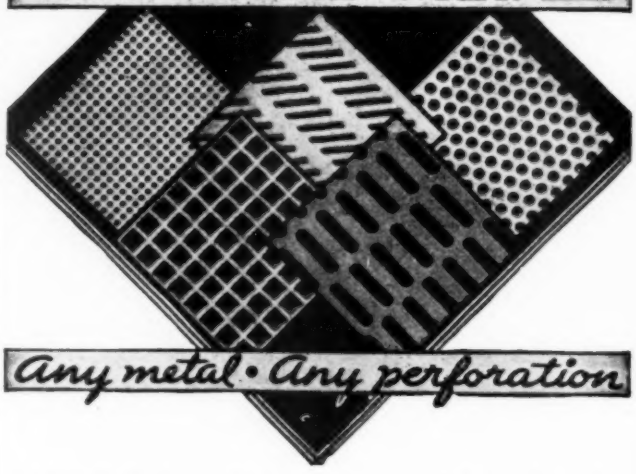
FURNACE FITTINGS

You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.

"Made-Rite" Co., Inc.
10th & Monroe St. Newport, Ky.

PERFORATED METALS



H. & K. Perforated Metals are accurately made and embrace a great variety of perforations for use in screening, grading, ventilating and straining of different substances.

Tell us your requirements and we will send booklet showing actual sizes of perforation.

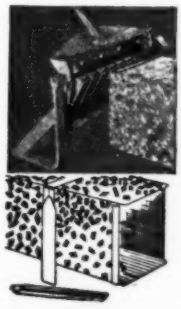
The Harrington & King PERFORATING CO.
5649 Fillmore Street, Chicago - 114 Liberty Street, New York

ALUMINUM DUCT WORK
MADE EASIER

Workers who make Sheet Aluminum Ducts have found that uniform Cleat Edges and the very best Drive-Cleats are really important in the final assembly . . . and equally important is that a tight and rigid seam be made.

SMITH'S CLEAT BENDERS
THE COMPLETE DRIVE CLEATING MACHINE
DOES THIS FOR YOU

SAVES MORE TIME per joint of pipe over ordinary hand methods than any other machine used on square pipe work . . . and is USABLE MORE OFTEN per job, because it makes uniform edges on the pipe and fittings, and makes perfect drive-cleats to join them together in a rigid tight seam.



A PATENTED FEATURE

Fingers on the bending mandrel are mathematically arranged so that certain combinations of them automatically allow bending Cleat Edges on most commonly used duct sizes, without further adjustments.

TWO SIZES

No. 12 up to twelve inches.
No. 18 up to eighteen inches.
CAPACITY: 20 gauge Mild Steel.

R. E. SMITH 1513 MONROE WAUKEGAN, ILL.

PERFORMANCE PLUS!
ATH-A-NOR
Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

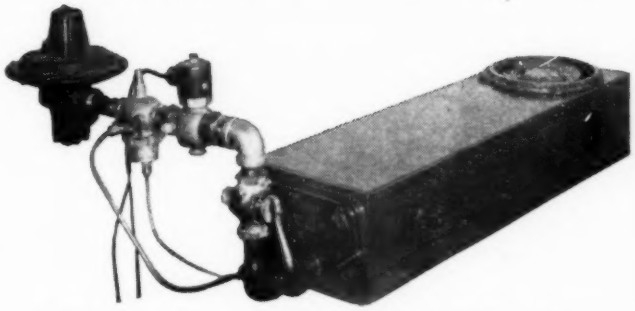
You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

Manufacturers of Quality Heating Equipment for Over Fifty Years.

Newark Ohio

QUICK DELIVERY
OF THE FAMOUS
JOHN ZINK BURNER



WE don't have to tell you that the John Zink Burner is one of the finest on the market, or that it's easy to sell and service, but we thought we'd better make it clear that we've built up quite a reputation for supplying them promptly. It's to your benefit to investigate our service and we'll be glad to accommodate you with the information you need if you'll just drop us a line.

Just remember there's a John Zink Burner for every heating and power need and it's easily and quickly available from Proie & Coogan.

PROIE & COOGAN HEATING CO.

WHOLESALE DISTRIBUTORS FOR INDOOR COMFORT SUPPLIES • ROOFING MATERIAL

6117 BROAD ST., PITTSBURGH 6, PA.

MOntrose 9300-01

BOOST PRODUCTION SCHEDULES WITH

MARSHALLTOWN THROATLESS SHEARS

★
CUT ANY SHAPE
★
CUT ANY SIZE SHEET
★

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. No matter what type of cutting—either irregular shapes or straight splitting—from ANY size sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.

Get Special Shear Bulletin today. Gives details of sizes from 18 gauge to one-half inch capacity.

MARSHALLTOWN MFG. COMPANY

920 E. Nevada St., Marshalltown, Iowa

REPAIR PARTS

for... **STOVES • FURNACES • BOILERS**

also

FITTINGS • REGISTERS • SUNDRIES

and...

FIVE GREAT LINES OF HEATING EQUIPMENT

★ **ARMSTRONG!** ★ **MODERNAIRE!**
★ **LUXAIRE!** ★ **RYBOLT!**
★ **JACKSON and CHURCH**

YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—

DES MOINES STOVE REPAIR COMPANY

SAM C. GREEN
FRED R. GREEN

DES MOINES, IOWA
SINCE 1869

GAS APPLIANCES PERFORM BETTER WHEN VENTED WITH

METALBESTOS

Solving the problem of providing perfect venting systems for gas appliances is easily done by specifying and installing Metalbestos. Metalbestos definitely exhausts burnt gases to the outside air, at the same time preventing condensation within the pipe. The patented construction of Metalbestos insulates hot gases against the outside air and allows them to rise in a gaseous state to the top of the run under perfect venting conditions.

There's no need for a makeshift "drainage" system, no floating flame at the burner, no corrosion in the pipe *or* appliance and no damage to walls.

Metalbestos is the scientific gas vent and flue which makes *any* gas appliance perform *better*. Why not write for more complete details?

Write now for literature.

WILLIAMS-WALLACE CO.

160 Hooper Street — San Francisco 7, Calif.

It is further recommended that the International Association appoint a Committee to confer with a similar Committee, appointed by the National Contractors Association, for the purpose of jointly assisting in a minimum standards of apprenticeship training for the Sheet Metal Industry on a National basis.

◆

Warm Air Floor Panel System

(Continued from Page 150)

continuous fan operation provides a positive supply at all times.

Summer Cooling

As the fresh air intake is designed to make possible a supply of 400 cfm, the system can also be used for summer ventilation. A damper, located at the return side of the furnace, can be adjusted to close off completely the return side of the heating system and allow only the outside air to be supplied through room registers. Inasmuch as all outside air admitted to the rooms is to be filtered, a lower pollen content can be obtained. This should prove beneficial to any of the occupants suffering from hay fever directly attributable to the pollen count of the outside air. The positive pressure maintained within the rooms will cause exfiltration to take place instead of infiltration.

Control Methods

Since this type of heating system differs so widely from the conventional methods of heating, standard control practices would be inadequate for maintaining steady inside comfort conditions over a wide range of outside temperatures. The

YOUR BLOWER Requirements

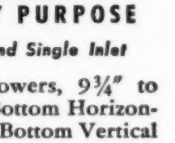
AVAILABLE AT

Schwitzer-Cummins Company

★ **BLOWERS FOR EVERY PURPOSE**

Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.



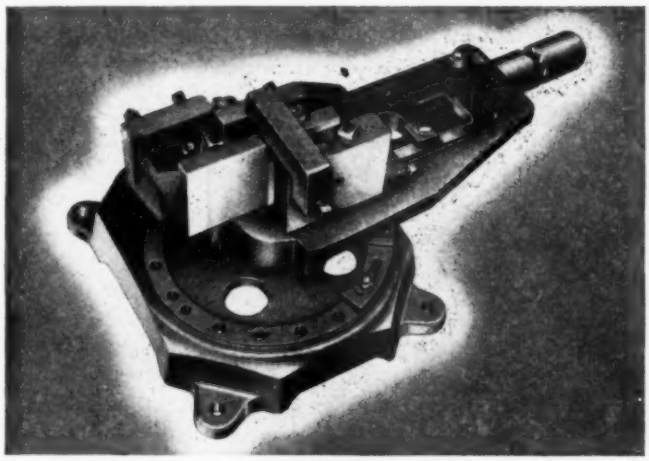
★ **CENTER DISC WHEEL**—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

★ **ENGINEERING DATA**—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

VENTILATING DIVISION
SCHWITZER-CUMMINS COMPANY
1125 MASSACHUSETTS AVE. • INDIANAPOLIS 7, U. S. A.

Save Time and Money with

JK Benders



JK NO. 4 BAR BENDER

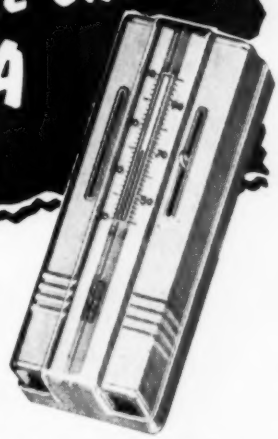
JK Benders are offered in a complete range of styles and sizes to meet the requirements for duplicating a large variety of shapes. They are easily set up for either hot or cold bending and there is practically no limit to the scope of work they can handle. If you have a bending problem you can solve it with a dependable JK Bender.

Send for Illustrated Folder and Price List

The JAMES KNIGHTS Company

SANDWICH, ILLINOIS

CUT SERVICE CALLS— INSTALL G-A CONTROLS



CALL backs from customers whittle away your profits. That's why profit-wise dealers install dependable G-A Temperature Regulators.

Gleason-Avery exclusive Straight Line Control eliminates troublesome sprockets and rotating arms. In case of current failure, draft damper closes automatically and check opens.

Get your full profit. Sell trouble-free G-A Controls.

Approved by Anthracite Industries Laboratory

No. 130 Furnace Sentry Unit Package for hand-fired systems, complete with thermostat, damper motor, and accessories—ready for easy, quick installation.

★

Direct orders accepted when accompanied by wholesaler's name and address.

Gleason-Avery, INC.

AUBURN, N. Y.

A RELIABLE NAME IN TEMPERATURE CONTROLS

NEW LOW PRICE!

BRUNO POWER CUTTER KIT

Cuts Holes 5/8" to 2½" in metal, wood, plastics

In plastic protective case

Now only $6.00 complete

Two Bruno Adjustable Hole Cutters in one convenient kit that keeps tools clean and blades sharp. High speed steel blade cuts clean, fast holes in metal, wood, plastics. Quickly adjustable and easily sharpened.. Designed by tool engineers to operate efficiently in bench drill, drill press, or portable drill. Bruno Hole Cutters in Kit 790 come with straight shanks for use in power drill; in Kit 790-B with square shanks for use in hand brace.

Ask your jobber or write Dept. AA-1

POWER CUTTER KIT CONTAINS			
Model	Shank Size	Expansion	New Low Price
100	1/4" St. Shank	5/8"–1-1/2"	$ 2.50
101	3/8" St. Shank	1" — 2-1/2"	$ 3.50
790 Kit	Contains one each of Models 100 & 101	5/8"–2-1/2"	$ 6.00*
790-B Kit	Contains one each of Models 100-B & 101-B	5/8"–2-1/2"	$ 6.00*

*Fair Trade Minimum $5.85

Depth in wood and plastics limited only by diameter of hole necessary to clear locking bolt.

BRUNO The BIG BUY in TOOLS

BRUNO TOOLS 9330 Santa Monica Blvd. Beverly Hills, California

EFFECTO-GRILLE

FORCED AIR

REGISTERS and GRILLES

Priced with the Lowest

Prewar quality . . . Adjustable Fins . . . Positive shutter operation . . . Reasonably prompt shipments.

WE ALSO MANUFACTURE A COMPLETE LINE OF **GRAVITY REGISTERS AND GRILLES**

Prompt attention to all inquiries

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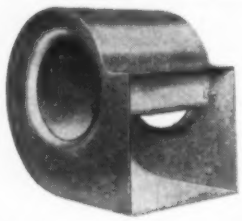
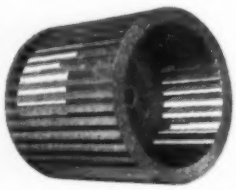
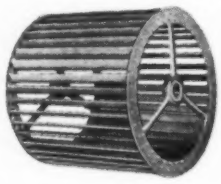
DETROIT 27, MICH.



Type "C" Wheel
Center Suspension

Type "SP" Wheel
Spoke Construction





Blower Assemblies Wheel Assemblies

• • Housing Assemblies • •

For Air Conditioning Equipment Manufacturers

SEE OUR DISPLAY
Booth No. 760
INTERNATIONAL
HEATING & VENTILATING
EXPOSITION
at CLEVELAND
JAN. 27 to 31, 1947

MASSACHUSETTS BLOWER DIVISION

The **BISHOP & BABCOCK** *Mfg. Co.*

4901 Hamilton Ave. Cleveland 14, Ohio

Moduflow system, manufactured by Minneapolis-Honeywell Regulator Company, was selected because it appears to be best suited to take care of the many factors involved.

The description of the operation of the control system is as follows: a remote temperature sensitive element will be located outside of the house where it can detect minute changes in outdoor air temperatures. This instrument will immediately signal any outside temperature changes to a master control panel which will be located in the utility room adjacent to the heating plant. Also connected to the master control will be a thermostat which, in effect, is an inside compensator. The thermostat consists of a bellows-actuated slide wire potentiometer, thus permitting a modulating control. In operation, as the outside temperature controller senses changes in outdoor temperature, it signals these changes to the master control panel. The latter, in turn, resets the control point of a second temperature controller which cycles the burner so as to furnish air temperatures called for by the outdoor controller. In addition, the room thermostat acts as a compensator to regulate further the temperature of the heating medium to offset in small increments internal changes caused by sun load, occupancy, cooking and other factors affecting inside air temperatures. By integrating the various control instruments into one complete control system, a change in any of the numerous factors affecting heat load is immediately sensed and a correction made in the heat input to the house.

A basic principle of this system is the nearly continuous operation of the furnace blower. In certain periods of the year when outdoor temperatures are relatively high, it will sometimes be desirable to reduce the quantity of the air flow. This will be accomplished automatically by means of a volume control damper within the heating system which is controlled

AVAILABLE FOR PROMPT DELIVERY

A newly designed Foot Power Squaring Shear embodying many new improvements not found on similar machines. Built in one size, 36" to shear 16 gauge soft steel and lighter.
All steel welded construction, unbreakable, will give many years of service. All parts of ample size, strongly braced to cut up to full capacity without springing. Top knife bar is provided with bronze gibs to compensate for wear. Blades are of the highest grade tool steel, hardened and carefully ground so as to give a maximum of service before regrinding.
Adjustable front and rear gauges are provided. Machine is also furnished with spring actuated hold-down.

Price—$225.00 F. O. B. Truck or Car, Chicago
Manufactured by Economy Tool & Gauge Company.
Exclusive distributors:

ACME EQUIPMENT COMPANY

128 SO. CLINTON STREET CHICAGO 6, ILLINOIS
ANDover 3430

MAKES *GOOD* INSTALLATIONS

BETTER!

WHEREVER gas or oil heating furnaces are installed condensation and corrosion on chimney walls and masonry becomes a destructive agent that must be eliminated for safety and economy. Right there is where you'll be able to safeguard your customer and your installation by selling the value of Heremetal Chimney liner. Explain how it prevents corrosion and condensation and thus removes the cause of unsightly and expensive deterioration to brick and mortar work . . . and how it will eventually result in a saving that will write off the original cost. You're sure of making a good job better and additional profits by installing Heremetal on all jobs of this type. Make a check of the chimneys in your neighborhood, too. You'll find additional business on existing installations. Plenty of literature available. Please write for it.

THE HEREMETAL COMPANY

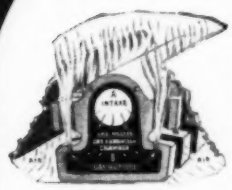
1310 Aldrich Avenue North Minneapolis 11, Minn.

COLUMBIA LITTLE GEM GAS BURNER

For Liquified Petroleum Gas

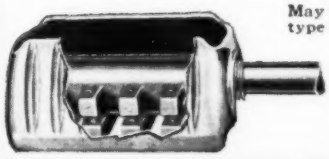
Immediate Delivery

Also Adaptable for Natural or Manufactured Gas



Just the burner for present day conversion. You can handle any job, domestic or commercial, with Little Gem. Easy to install. Minimum service required. Gives complete combustion without pre-mixing.

MULTIPLE UNIT BURNER



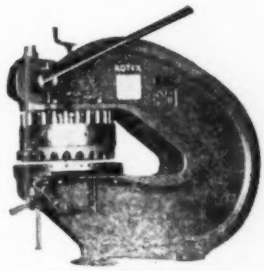
May be hooked up in series to fit any type circulating heater, steam tables, enameling ovens, galvanizing tanks and many other applications. Write for circular.

See the Complete Line at the **Cleveland Exhibition**

THE COLUMBIA BURNER CO.
729 Ewing Street · Toledo 7, Ohio

ROTEX QUICK CHANGE PUNCHES

Save **TIME** *and* **MONEY** *with the* **ROTEX** *18*



17 Punches 5/32" to 2" and a 2" Nibbling Shear Mounted for immediate use.

Here's the answer to speeding up production capacity in your shop. The Rotex quick change punch reduces punch changing time to a matter of seconds while at the same time affording you the opportunity to give your customers cleaner, neater, and faster work. Faster turnover and faster output result in better profits—and better work will give you more satisfied customers. Put your shop on a more efficient basis with a Rotex Punch. The Rotex Line is available for immediate delivery. Available with or without stand.

Drop us a line today . . . we'll be glad to send more information

ROTEX PUNCH COMPANY
4726 East 12th Street – Oakland, California

If Your Controls are *Standard*

Everything is under control

STANDARD REMOTE CONTROL dedicates all of its experience, its abilities and its resources to assure you that *"If your controls are Standard, everything is under control."* Send us your blueprints and specifications for recommendations from our competent corps of engineers.

Standard REMOTE CONTROL VALVE COMPANY
205 PASADENA AVENUE • SOUTH PASADENA, CALIFORNIA

The Standard SERVICE INSTRUMENTS *for Heating Men*

SHOWS NEED FOR REPAIRS OR MODERNIZATION OF HEATING INSTALLATIONS!

DEMONSTRATES THE HEATING COMFORTS THAT WILL RESULT FROM THE RECOMMENDED IMPROVEMENTS!

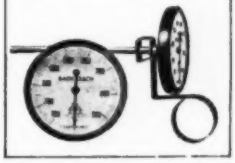
SETTLES COMPLAINTS DIPLOMATICALLY AND KEEPS YOUR CUSTOMERS SATISFIED!

The TEMPSCRIBE Temperature Recorder above (and a companion Motor Operation Recorder), and the dial-type Thermometer at the right, are instruments that can help you obtain maximum profit on service jobs—*and build your reputation for reliable, expert service.*

Write for Thermometer Leaflet 708 and TEMPSCRIBE Recorder Bul. 704.

RANGE—100° to 950°F.

Ideally suited for checking temperature of flue gas, as well as in warm air ducts and at register outlets for balancing heat distribution.



BACHARACH INDUSTRIAL INSTRUMENT CO.
7000 BENNETT STREET, PITTSBURGH 8, PA.
MEMBER OHI OIL-HEAT INSTITUTE OF AMERICA

for BETTER PRODUCTION and MAINTENANCE

at Lower Cost

A proved time-saver in any sized shop. Libert's *flexibility* gives you a wider variety of work—clean shearing of flat or formed sheet metal... straight or irregular shapes... inside or outside cuts. Libert *simplicity* means that even unskilled labor soon does accurate work, lots of it *and fast!* Write for Bulletin.

Made in sizes up to 60 in. throat, 10 gauge capacity

LIBERT MACHINE CO., GREEN BAY, WIS.

Libert Hi-Speed SHEAR

AJAX

FURNACE PIPE and FITTINGS

for Forced Air and Air Conditioning Installations

- The quality of "AJAX" Fittings is fully guaranteed.
- Scientifically designed to reduce air friction.
- Double seamed to add strength, durability and air-tight construction.
- Made of high-grade full gauge sheets. No seconds used.
- Every order, large or small, receives personal attention.
- Our engineering department is at your service and will gladly help you solve your heating problems.

AJAX FURNACE FITTING CO.

Division Of

THE CINCINNATI SHEET METAL and ROOFING CO.

216-20 E. FRONT ST. CINCINNATI, OHIO

through the master control panel.

As stated in the introduction, the lack of specific information on panel heating in the colder climates indicates a definite need for a research program to obtain factual data.

The University of Minnesota has enlisted the cooperation of the National Builders, Inc., and the Minneapolis-Honeywell Regulator Company in conducting a research project for further study of floor panel heating systems. The National Builders, Inc., have agreed to the use of the first unit of the Addition, which has been fully described in this article, for a year-round study.

The project is to include a study of controls, ground temperatures under concrete slabs, heat losses to the ground, losses through concrete footing walls, inside surface temperatures, inside air temperatures, temperature distribution across floor surfaces, vapor movement through both the ground and floor slab, condensation in ground slab with summer ventilation and friction and dynamic losses for the heating system.

•

Depreciation

(Continued from Page 106)

can *often* lead to substantial tax savings. For example, you have a building which cost $50,000 ($10,000 cash plus a $40,000 mortgage). The building has an estimated life of 50 years. At present, the building has been depreciated for 10 years and has a depreciated cost of $40,000. You get the Commissioner's approval to change to the declining balance method. Under this method, the rate used would be 3.75% (remaining life 40 years; regular depreciation rate 2.5%; 150% of 2.5% equals 3.75%).

Here is the comparison of the amount of depreciation which

QUIET OPERATION

WITH THE

Am-Pe-Co Unipack Blower

"Quiet as a Cat's purr"

Furnace blowers are much the same in construction and operation and it takes painstaking attention to detail to manufacture one that really stands out. We've been making the Unipack Blower to the same consistently high standards since 1929. It will install with a minimum of difficulty and will operate for many, many seasons at top efficiency and with the very nearest approach to absolute silence. Two quickly removable service doors permit ready inspection as well as changing of filters. It's really "quiet as a cat's purr" and a little investigation on your part will convince you of it's sales possibilities. Please write us today for literature.

American Machine Products Co.

MARSHALLTOWN, IOWA

Sell your customers on
LUMINOUS FLAME HEATING

SPECIFY AND INSTALL SCHWAB CONVERSION BURNERS

Luminous flame heating is a strong selling point. It helps you put over the Schwab Conversion Burner to your prospects because you can show them how it converts practically all the energy present in city gas to usable heat. This is done with amazing operating economy because the luminous flame closely resembles the flame for which furnaces are built. The radiant heat of the luminous flame is accomplished by a precise and continuous mixture of fuel and air achieving a high degree of heat transmission through the walls of the furnace.

The Schwab Conversion Burner will put profits in your pockets quickly . . . investigate its superior construction and performance today. Write us for literature.

(81 years of continuous manufacturing experience.)

THE Schwab Safe Company
LA FAYETTE, INDIANA

A SUPERIOR PRODUCT *in* FURNACE PIPE and ELBOWS

Good merchandise is more than just idle talk with us . . . . we DO make a sincere and honest effort to provide you with the finest obtainable furnace pipes and elbows. Superior products are stamped at the factory with our trademark and we're sure when they leave they will REALLY adjust. No jiggling or cutting, the first try at installing them is the last . . . . they'll FIT easily and permanently and save you time, trouble, and money.

Quality is the watchword at Superior . . . . investigate our line today and you'll be easily convinced that your first job with Superior furnace pipe and elbows will lead to many more.

Why not drop us a line now for more information?

***Superior* PRODUCTS CO.**
606-610 South 14th St., Omaha 2, Neb.

THE PROOF'S in the USE

RUBYFLUID FLUX

One trial of Rubyfluid paste or liquid flux will convince you that you get stronger, neater, longer lasting soldering jobs than you have ever had before.

Rubyfluid acts faster, saves time, speeds production. There are no harmful or objectionable fumes to affect the operator, his clothes or tools. Rubyfluid Flux makes solder flow in a thin film —gives a better appearing joint and saves solder.

Ruby's Stainless Steel Flux is a special formula approved by the makers of stainless steel — it does not stain or corrode the metal and its use does not require excessive heat or extra equipment.

For a BETTER JOB—always use RUBYFLUID FLUX

Rubyfluid is packaged in sizes to fit every need — paste in 2, 4, 6, 8 and 16 ounce cans — liquid in sizes from 3 ounces to 55 gallon drums.

RUBY CHEMICAL CO.
74 McDowell St., Columbus 8, Ohio

Rubyfluid

MAPLEWOOD HUSKY-LITE COMBINATION MACHINE

20 Gauge Capacity - Immediate Delivery

A HUSKY—LIGHT WEIGHT ALL-PURPOSE MACHINE, made from SPECIAL ALUMINUM ALLOY. Weight (less standard) 15 lbs. Equipped with steel cut gears. Steel rolls (2" long) are machined, hardened, ground and keyed to fit shafts.

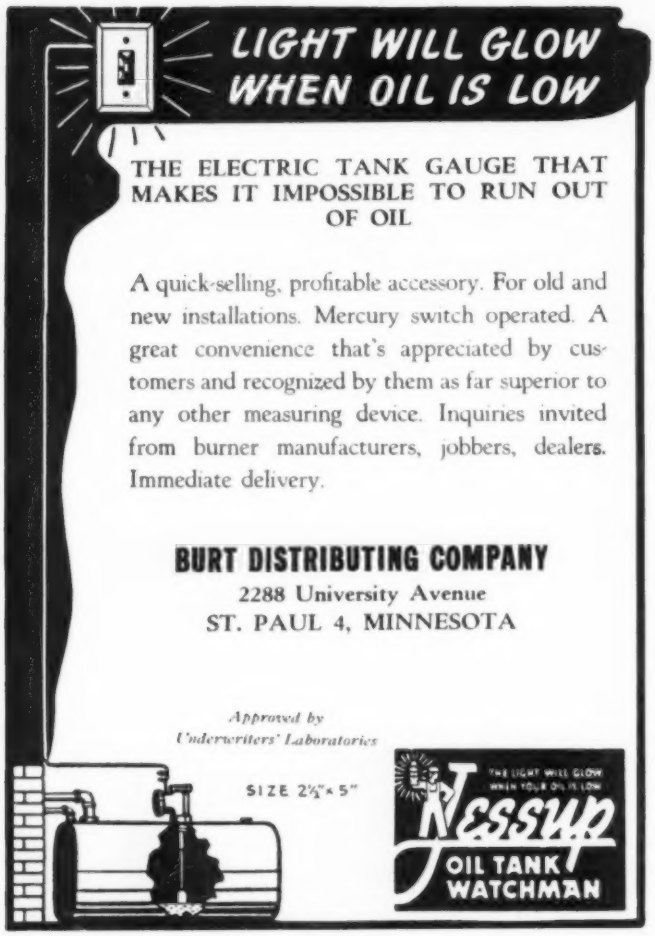
A large interchangeable gauge (3¼" x 2½") and handles for either top or bottom shaft permits clockwise or counter-clockwise operation.

BURRING
TURNING
WIRING
SINGLE BEADING
O. G. BEAD ROLLS
EDGE STRAIGHTENING
STRETCHING
CRIMPING
COMBINATION CRIMPING & SINGLE BEADING

SEE US FOR—

Pittsburgh Lock Machines, Roll Forming Machines, Roller Dies, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery.—Your inquiries invited.

MAPLEWOOD MACHINERY CO.
2634 FULLERTON AVE. CHICAGO, ILL.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WHEN OIL IS LOW
THE ELECTRIC TANK GAUGE THAT MAKES IT IMPOSSIBLE TO RUN OUT OF OIL
A quick-selling, profitable accessory. For old and new installations. Mercury switch operated. A great convenience that's appreciated by customers and recognized by them as far superior to any other measuring device. Inquiries invited from burner manufacturers, jobbers, dealers. Immediate delivery.
BURT DISTRIBUTING COMPANY
2288 University Avenue
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Approved by Underwriters' Laboratories
SIZE 2½" × 5"
THE LIGHT WILL GLOW WHEN YOUR OIL IS LOW
Nessup
OIL TANK WATCHMAN

will be allowed in the next three years:

Year	*Declining Balance (With 150% limit)*	*Straight-Line*
1946 (3.75% of $40,000)	$1,500	$1,000
1947 (3.75% of $38,500)	$1,444	$1,000
1948 (3.75% of $37,056	$1,390	$1,000

The declining balance depreciation will continue to exceed the straight-line depreciation for the first 11 years. Thus, you get a tax break until 1957.

News Items . . . . . .

(Continued from Page 234)

The New Lanham Act

The Lanham Act has finally been passed by Congress, eight years after it was first introduced. Designed to supplant the outmoded trade mark act of 1908 the Lanham Act will go into effect in July of 1947. Purpose of the Act when originally written was to clear up some of the haze and uncertainty that surrounds the use of trade marks in this country. It has been proven historically that the better the trade mark, the greater the possibility of having it become a generic term for a certain product and lose its identification with the initial manufacturer.

The way in which this comes about has been very strange since some names such as Kodak, Coca-Cola and Linotype have retained their value as trade marks while others such as linoleum, cellophane and milk of magnesia have actually become household words and lost their identity with the firm

(Continued on Page 262)

JOHNSON
BENCH FURNACES
No. 118
Combination Bench Furnaces
No forced air blast required for this handy furnace. Use it for heating largest soldering coppers, branding irons or tempering heat treating, annealing, case hardenings or soft metal melting. Removable lid on hood permits using 22 lb. capacity melting pot.
No. 101
Powerful, efficient, economical. Gives 1800° F. without a blower. Write for details and prices.
Parts available for any Johnson Furnace built since 1901.
FREE Illustrated Johnson Catalog showing complete line of furnaces.
JOHNSON GAS APPLIANCE COMPANY
580 E Avenue N.W., Cedar Rapids, Iowa

PENN-AIRE FURNACES
GRAVITY, CAST IRON
Popular Price *Practical Design*
Economical Operation
UNION MANUFACTURING CO., INC.
BOYERTOWN, PA.

WHICH CLAMPING DEVICE MEETS *Your* NEED?

Do you have to hold small assemblies for drilling or welding? Are you required to hold work at odd angles? Is clamping space limited? Must you exert great pressure to hold parts?

In a word: What are your clamping problems?

Knu-Vise, through many years, has learned the most efficient way to coordinate clamping operations with production requirements; and this background of experience can be made valuable to you.

Knu-Vise toggle-action clamping devices (only a few shown here) are recognized for their bull-dog grip and quick release, and their capability of simplifying and increasing production.

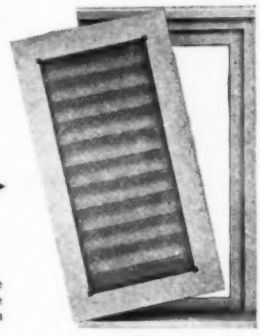
Ask us for any help you need in clamping operations. In the meantime, would you like a catalog?

KNU-VISE INCORPORATED

2200 - 8th Street, Detroit 16, Mich.
422 Magnolia Avenue, G'end a e 4, Cal.

Arr-O-Line LOUVERS for Rust-Proof Ventilation

Arr-O-Line Louvers are made with materials that are rust-proof, acid resisting and corrosion proof. The face frame is Masonite Prestwood, no seams, spotwelds, rivets or screws. Arr-O-Line Louvers have unobstructed air travel which provides maximum ventilation. Louver boards are free from frame to allow for expansion.

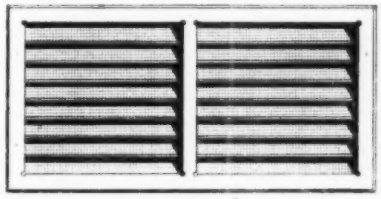


SPECIAL Louvers ➤ *for new construction*

- Easy to Install
- Nice job; no exposed nails

STANDARD Louvers — good for the life of any standard building. Can be installed from the inside. Made in 11 sizes.

LOUVERS for Attic Ventilation



equipped with **LUMITE PLASTIC SCREEN**

- Won't stain
- Outlasts Metal
- No rust or corrosion

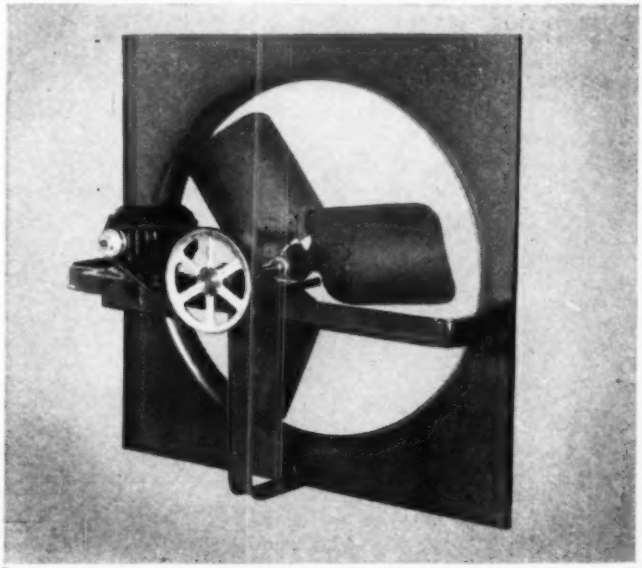
ARR-O-LINE, Manufacturers
3060 4th Ave. So. Minneapolis, Minn.

ADAMS FIRING TOOLS

CLINKER TONGS
ASH REMOVERS
FURNACE POKERS
FIRE RAKES
FIRING HOES

Buy Adams Known Quality

THE ADAMS COMPANY
BRIDGE STREET DUBUQUE, IOWA



Immediate Delivery

ATTIC and EXHAUST FANS

BELT DRIVEN SIZES 24" TO 60" • DIRECT DRIVEN SIZES 18" TO 24"
MANUFACTURERS OF A COMPLETE LINE OF
SHUTTERS, FAN PARTS AND FAN BLADES
SPECIAL BLADES BUILT TO FIT YOUR MOTORS

ENGINEERING SERVICE

Prompt Attention to All Inquiries

LAKEWOOD ENGINEERING & MFG. CO.
1756 W. LAKE STREET CHICAGO 12, ILL.

ATTENTION DEALERS!

OIL CONVERSION BURNERS

1 to 5 Gallon Capacity • *Immediate Delivery*

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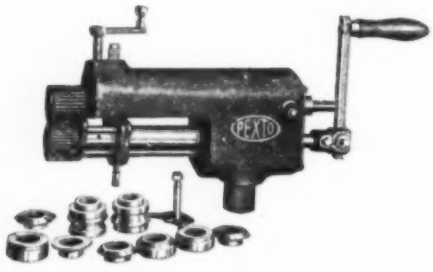
UNiversity 1-3600

FEDERAL

EXCLUSIVELY—

SHEET METAL FABRICATING MACHINERY

• A PRACTICAL CONSULTANT SERVICE MACHINERY APPLICATION



LARGEST DISTRIBUTORS FROM STOCK

FEDERAL MACHINERY CO.

134 GRAND ST., NEW YORK 13, N. Y.

News Items . . . . . .

(Continued from Page 260)

which first marketed them.

One of the most important features of the Lanham Act is that it will protect the national advertiser who brings a new product on the market with what he thinks is a new trade mark and then finds that some small regional producer has been using the name previously. Formerly the national advertiser would be open to suit but now all that would result would be the granting of local rights to the "ambush" company.

STATE SUPPLY CO.

•

Wholesale Distributors
Furnace Supplies
Plumbing and Heating Specialties
Manufacturers catalogues solicited

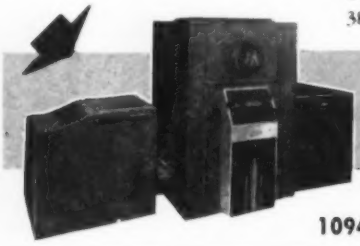
•

1336 N. W. Northrup Portland 9, Oregon

LEON GOSLING, Mgr. Phones: BR. 3961 AT. 5943

EFFICIENT HEAT *without* CLINKER NUISANCE *in the* NEW *Majestic* STOKER FURNACE

This smartly designed, rugged unit is tops in home-heating service, convenience, and economy. Special crown radial fins boost heat output. Inner can permits clean, easy clinker disposal. Any domestic stoker fits either side. It's a Majestic climax to 38 years' experience in heating.



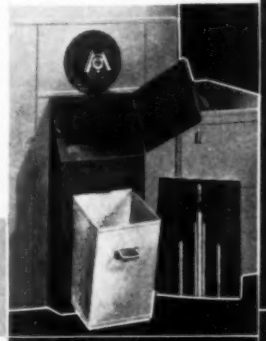
Made of HEAVY DUTY STEEL

•

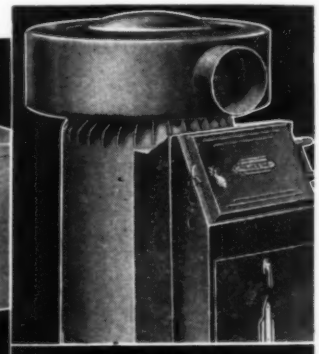
For GRAVITY or FORCED AIR SYSTEMS

THE *Majestic* CO.

1094 Erie St. Huntington, Ind.



Built-in Container for Clinker Removal

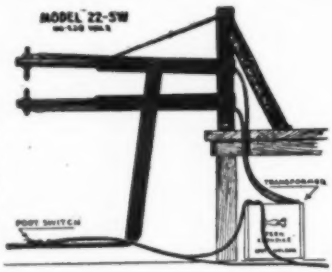


Conduvectors for More Heat

FERN

Klondike Spot Welder

Model 22SW Bench Type



Operates on any ordinary 30 or 60 amp. electric service. Spot welds 20 gauge or lighter metal, cold-rolled steel, hot-rolled steel (Clean, Pickled), Stainless Steel, Nickel Plated Steel, Nickel Alloys, Monel Metal, Silicon Bronze Type Alloys, Pure Zinc and Nickel Silver, Unpickled Hot-Rolled Steel, Aluminum and its Alloys, Tin Plate, Terne Plate, Chrome Plate, Galvanized Iron and other coated materials. The Fern Klondike Spot Welder costs but a third of other spot welding equipment but does the work of machines which cost three times as much. This equipment can be transferred from job to job or can be used on a bench in shop. Can be purchased in an 18 or 20 inch throat, very simple to operate.

RALPH FERN 2517 Boulevard Ave. Scranton 9, Penna.

FLUID PUMP

THE IDEAL PUMP FOR EVAPORATIVE COOLERS . . . DEPENDABLE AND FULLY GUARANTEED . . . STAINLESS STEEL HOUSING . . . PLASTIC SCREEN EASILY REMOVED FOR CLEANING.

Made by Pioneer Manufacturer of pumps for Evaporative Coolers. Thousands now in use. Trouble free. Oil hole for motor easily accessible. Air vents in housing permit free air circulation, but no water touches motor. Bracket for mounting, standard equipment.

$19.50 LIST PRICE—POSTPAID

JOBBER & DEALER INQUIRIES INVITED

EVAPORATIVE COOLER KIT

This kit provides all of the essentials for Evaporative Cooling: Pump, Float Valve and Switch. Complete kit only . . .

LIST PRICE $25.50

AMERICAN METAL PRODUCTS CO.

FT. WORTH, 9 TEXAS

Heat-Oil Inc. Makes Plans for 1947

WANTED *for Representation...* MANUFACTURERS'

OIL BURNING EQUIPMENT LINES

- ACTIVE LIST OF 1700 DEALERS
- COMPLETE ADVERTISING & SALES COVERAGE IN U. S.
- WILL TAKE ENTIRE FACTORY OUTPUT
- CAN ASSIST WITH YOUR FINANCING
- CAN PROVIDE MOTORS & TRANSFORMERS IF NECESSARY

write wire phone **HEAT-OIL INC.**
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THE SEAL OF GOOD SOLDERING — TINIT — CLEANS AND TINS METAL IN ONE OPERATION — TO SOLDER ... TIN-IT FIRST

TINIT

SOLDERING COMPOUND

ESTABLISHED 1929

[Reg.—U. S. A.—Canada

Penetrates rust, paint and grease. Tins Stainless Steel, Galvanized and Black Iron. Cleans and Tins by simply applying heat. Sold through Sheet Metal, Automotive, Refrigeration Service, Etc. Jobbers. Used by Army and Navy.

TINIT MFG. CO.
Box 794, Denver 1, Colo. – Factory: 1635 Platte St.

REPAIRS FOR ANY FURNACE BOILER OR STOVE

REPAIR PARTS FOR ANY FURNACE, BOILER OR STOVE

Complete Line of Sundries and Supplies

FOR QUICK SHIPMENT

OMAHA STOVE REPAIR WORKS
1206-8 DOUGLAS ST., OMAHA 2, NEB.
SINCE 1882

Schild

ALL-PURPOSE METAL CUTTER

Get this new labor saving tool for "on-the-job" or shop work.

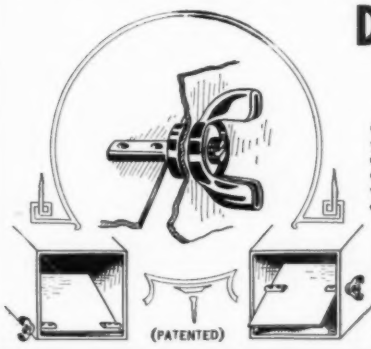
Easily cuts metal, heavy as 16 ga.
Changeable blade of tough tool steel.
Handle forged of rugged spring steel.
Designed and built for abuse.

At your Jobber Dealer or send check or money order for immediate prepaid shipment.

Complete Tool $5.00 Extra Blade 75¢

Schild **MANUFACTURING COMPANY**
739 Broadway Milwaukee 2, Wis.

The **GOESE TIME SAVER DAMPER CONTROL**



Order a gross today through your jobber of these superior quality damper controls used on either square or round pipe, it will enable you to turn out jobs easier and faster.

GOESE MFG. CO.
2548 N. Eighteenth St.
Milwaukee 6, Wisconsin

Heating Sheet Metal — FRANK X ENDERLE — Air conditioning supplies

Furnace pipe, adjustable elbows and Fittings

ALSO
Complete line sheet metal hand tools

Frank X Enderle, Inc., Ltd.
1600-1700 San Fernando Road
Los Angeles 41, California

Storm Proof!

WESTERN ROTARY TURBINE

EVERYTHING going out—nothing coming in! That's how the Western Rotary Turbine Ventilator operates. Centrifugal action of revolving head throws off all rain or snow, even if head is revolving at lowest speed.

Our Bearings Carry a Life-time Guarantee.

FREE Engineering Ventilating Service —WRITE FOR CATALOG—

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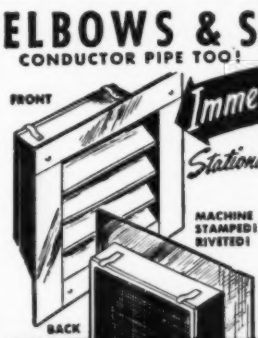
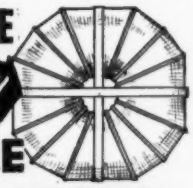
1730 E. Washington Blvd., LOS ANGELES 21, CALIF.

ELBOWS & SMOKE PIPE
CONDUCTOR PIPE TOO!



Immediate Delivery



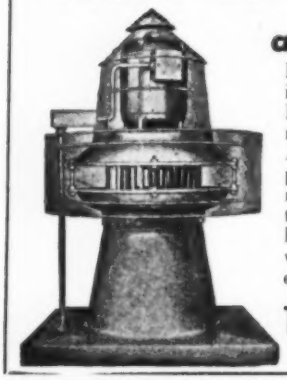
Stationary **LOUVRE VENTILATORS**

- PRIME COATED GALVANIZED IRON, COPPER, ALUMINUM OR STAINLESS STEEL
- EVERY ONE IDENTICAL • NO VARIATIONS

WRITE FOR PRICE LISTS AND FURTHER DETAILS

KRAUSER-BOYD, INC.
553 RIVER ROAD • N. TONAWANDA, N. Y.

MOVE 30% MORE AIR



at less power cost!

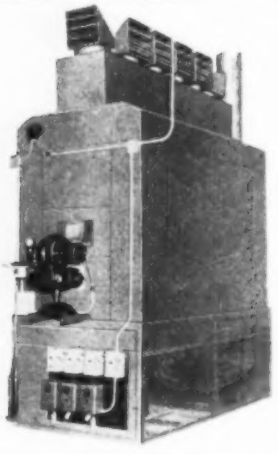
Here's a new idea that revolutionizes ventilating . . . the Air-Van Power Exhauster moves 30% more air at less power cost! Accepted everywhere for its phenomenal performance, superior design and splendid construction, the Air-Van Power Exhauster is your answer to all ventilating problems! Write for complete details today.

THE GALLAHER COMPANY
OWATONNA, MINNESOTA

News Items . . . . . .

Non-Ferrous Supplies

PROSPECTS are fair for increased quantities of lead, copper, aluminum magnesium in 1947, although demand will probably exceed supply. Zinc is expected to about equal 1946 production. Domestic production of lead is estimated at 800,000 tons and demand 1 million. Copper requirements are set at 1,500,000 tons monthly while supply is holding firm at about 60 per cent of demand. Total domestic production of slab zinc is estimated at about 740,000 tons, slightly below 1945.



ARTCRAFT *DIRECT FIRED SPACE HEATERS*

A Modern, Economical, and Flexible Method of Heating Large Areas.

Capacity 100,000 to 1,500,000 B. T. U.

FOR OIL — GAS — STOKER FIRED

- Industrial Buildings
- Factories
- Repair Shops
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CHICAGO STEEL FURNACE COMPANY
9326 S. Anthony Avenue — Chicago 17, Ill.

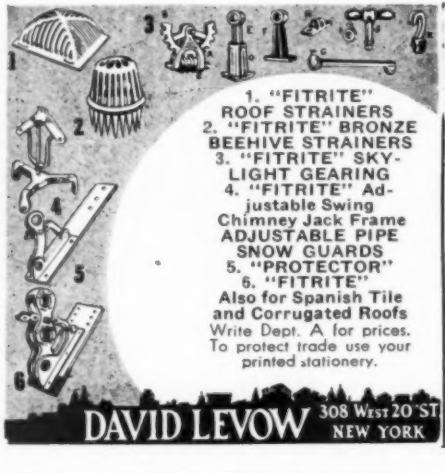
LANCOL

A Definitely Better SOLDERING FLUX

FOR STAINLESS STEEL AND ALL ALLOYS

Used exclusively by many fabricators of Stainless Steel and other metals. Flows freely without rolling up. Provides even coverage. Flows through lap joints without tinning before being lapped. Forms perfect bond. Has no strong corrosive action. Odorless—no injurious fumes.
Sample for trial on request.

F. H. LANGSENKAMP COMPANY
Dept. A. 227 East South Street, INDIANAPOLIS, INDIANA


1. "FITRITE" ROOF STRAINERS
2. "FITRITE" BRONZE BEEHIVE STRAINERS
3. "FITRITE" SKY-LIGHT GEARING
4. "FITRITE" Adjustable Swing Chimney Jack Frame
ADJUSTABLE PIPE SNOW GUARDS
5. "PROTECTOR"
6. "FITRITE"
Also for Spanish Tile and Corrugated Roofs
Write Dept. A for prices. To protect trade use your printed stationery.
DAVID LEVOW 308 West 20 St. NEW YORK

"RIVAL "and "FITRITE" Ornamental Leader Straps COPPER & ZINC in 6 Styles
Write for folder and free samples.
Sold through Jobbers only.

ORNAMENTS

STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING
65 YORK STREET — BROOKLYN, N. Y.

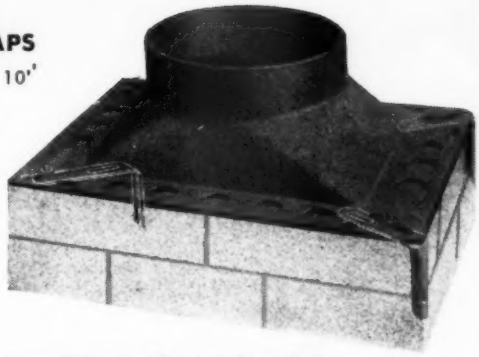
Vernois

Repair parts for Vernois furnaces are quickly available at our plant. Some furnaces have performed well beyond their normal span because of the owner's inability to obtain new equipment and you'll be able to make them perform at their best efficiency until new models are plentiful by repairing them with Vernois originals.

MT. VERNON FURNACE & MFG. CO.
MT. VERNON, ILLINOIS

ADAMS CHIMNEY CAPS

For 7, 8, 9 & 10" Chimney Extensions



Buy Adams Known Quality

THE ADAMS COMPANY

BRIDGE STREET — DUBUQUE, IOWA

Available Now!

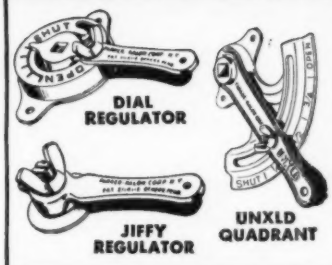
CHENEY FLASHING 16 OZ. COPPER 3 WAY BOND

CHENEY FLASHING REGLET 16 OZ. COPPER

SEE YOUR JOBBER OR WRITE US—

CHENEY INDUSTRIES, Trenton, N. J.

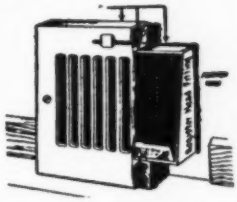
A Type and Size for Every Need



For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 200 Varick Street, New York.

PARKER-KALON damper controls

LICK THE MATERIAL SHORTAGE AND KEEP YOUR MEN GOING BY STREEKNOTIZING



STREEKNO eliminates dirty, streaky walls due to air seepage thru open joints around register box and plaster wall—open joints between register box and register—open spaces under and back of the register.

STREEKNO Packing Seals all the Open Joints on all Sides and Bottom of the Register.

STREEKNO Register Packing is a resilient Rock Wool Product. It is guaranteed fireproof, rot proof, vermin and termite proof. Will not shrink or deteriorate. It fits any size register and lasts as long as the building.

HOW IS THIS FOR PROFIT? Material for one register costs 55 cents. You charge $2.00 per register. Your profit for 10 minutes installing time, $1.45 per register.

Order from your Jobber or write for Literature and Details

EXCEL HEATING and AIR CONDITIONING CO.

3715-19 Belmont Ave. — Chicago 18, Ill.

INCREASE PRODUCTION and EFFICIENCY with these ALL-PURPOSE BRAKES

The Utility Bending brake weighs 175 lbs., folds into compact bundle and will handle 26 ga. easily. Completes stack or duct 4" square up to any size. Makes corner or center lock, each piece seamed and locked completely, on the brake.

BOBBY BRAKE

A small one footer for small bending. Handles 26 ga. Iron, 12" wide. Just the thing for warm air boxes, drive cleats, Z bars, etc. Gutter Ends.

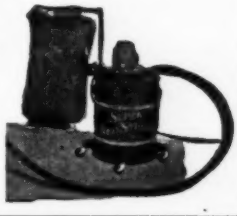
Increase the efficiency of your shop with these excellent time savers. Tool stand and bench attachment available, weight 16 lbs. Write us today for literature.

A. R. HARRIS COMPANY

4548 Hohman Ave. — Hammond, Indiana

Chimney Cleaning Tools Are Standard Equipment

A clean plant and a dirty soot-plugged chimney is a good job only half done. Super Red Streak chimney cleaning tools do the job from the basement, not the roof. They are included with every Super Red Streak Furnace Cleaner. Try a Super 5 days free. Write for data.



NATIONAL SUPER SERVICE CO., INC.

1944 N. 13th St. Toledo 2, Ohio

RUDY — **THE MARK OF QUALITY**

A COMPLETE LINE OF HEATING AND AIR CONDITIONING EQUIPMENT

RUDY FURNACE CO., DOWAGIAC, MICH.

REPAIR PARTS *for* STOVES • FURNACES • BOILERS • WATER FRONTS

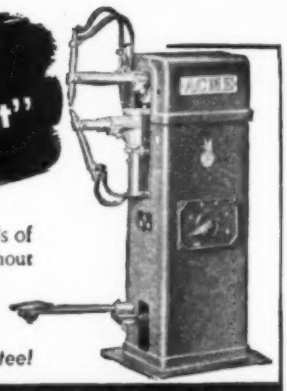
GEO. A. PULLEN

STOVE & FURNACE REPAIR CO.

ESTABLISHED 1882

1333 LAWRENCE STREET — DENVER 2, COLORADO

SPOT WELD
WITH
ACME "Hot Spot"
WELDERS



- Proven utility for years in thousands of sheet metal fabricating plants throughout the world.
- Write for literature and prices
Complete range of sizes

Lifetime Guarantee!

ACME ELECTRIC WELDER CO.
2618B FRUITLAND ROAD — LOS ANGELES 11, CALIF.

Atomic Welding — Brotherton

(Continued from Page 166)

small holes in the center of the weld bead, may occur. This is caused by trapping the gases in the weld metal and can be prevented by reducing heat input and slowing the rate of welding.

Many industries concerned with metal fabrication have failed to investigate the possibilities which atomic hydrogen welding may hold for them in performing a superior job. A study of the benefits which this fast, clean method of joining metals produces may be in order for the manufacturer who is having trouble with a difficult welding task. For applications where high strength, smooth appearance and sound, dense structure are demanded in weld seams, atomic hydrogen has a definite superiority which is rapidly expanding its use.

FEW AS GOOD

GILTEDGE

NONE BETTER

Stokers
Handy Fittings
Repairs

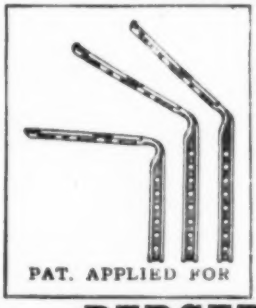
Blowers
Rock Island Registers
Humidifiers

FURNACES

All genuine Gilt Edge repairs carry a label saying "Genuine Gilt Edge Part." We have genuine Gilt Edge repairs for Gilt Edge Hummer, Gilt Edge Crescent, Gilt Edge Radium, Gilt Edge Badger, Gilt Edge Liberty, Gilt Edge Solar, Gilt Edge Fireside, 500, 600, 700, 800 and 900 Series Furnaces and Gilt Edge Round and Square Boilers. We are successors to the Schwab & Sercomb Co., R. J. Schwab & Sons Co., and the Schwab Furnace & Mfg. Co. Buy from jobbers who carry genuine Gilt Edge repairs or write us.

SCHWAB FURNACE CO.
332 WEST FLORIDA ST.
MILWAUKEE 4, WISCONSIN

IMPROVED!



PAT. APPLIED FOR

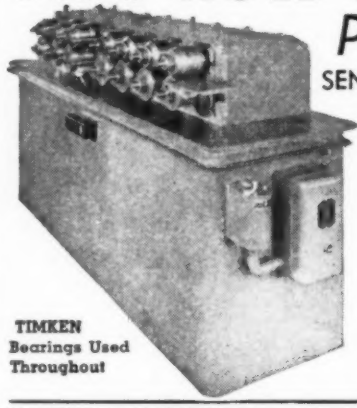
• B B •
No. 12 SHANK
33⅓% STRONGER

IMPROVEMENT IS APPLIED TO No. 15—SQUARE, No. 12—⅛ PITCH, AND No. 25—¼ PITCH.

SOLD THRU LEADING JOBBERS EVERYWHERE

BERGER BROS. CO.
Main Office & Factory
229-237 Arch St., Philadelphia, Pa.

Got a ROLL FORMING PROBLEM?
SEND IT TO DAHLSTROM



TIMKEN Bearings Used Throughout

With fifteen years of experience—Dahlstrom brings you added improvements in the finest constructed roll forming machines, to enable you to produce intricate jobs quickly, easily and economically.

Send sample or sketch for quotation

DAHLSTROM MACHINE WORKS
4970 No. Elston Ave.
Chicago 30, Ill.

NEW! Powerful Efficient Speedy

TORNADO
Electric Blower
[for quick removal of Dust—Dirt—Lint

NEW? design insures more powerful blast of air for faster removal of dust, soot, dirt, etc. from heating and air conditioning equipment. Improved fan, back plate and switch design. Universal motor. Sealed ball bearings. No oiling. Plugs in anywhere. *Request details and FREE TRIAL*

BREUER ELECTRIC MFG., CO. 5082 N. Ravenswood Ave., CHICAGO 40, ILL.

DASCO
Forged Hand Tools

Chisels, punches, drills, screw drivers, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.

DAMASCUS STEEL PRODUCTS CORP.
ROCKFORD, ILLINOIS

AMERICAN ARTISAN

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"CENTRAL-WEST" can furnish your Sheet Metal Machinery Requirements

. Steel Hand Brakes . Press Brakes . 'Rex' Spot Welders

—LOCKFORMERS—

. 'Pexto' Shears, Folders, Rolls, Rotary Machines, Etc.

. Whitney Tools . Electric Shears, Drills . Shop Tools

—Smith Cleat Benders—

Complete Line of Sheet Metal and Ventilating Supplies

FRED E. MILLER — "Always Ready to Serve You" — N. A. LINDVALL

CENTRAL-WEST MACHINERY CO.

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NEW ADJUSTABLE (PATENTED) HOLE CUTTERS

Cuts any size hole ¾" to 12" in any metal. Sales representatives wanted. Ask for Bulletin A.A.

N. J. FRAYN CO.

REDWOOD CITY, CALIF.

"DAVIS" CLIP PUNCH

Just the thing for fastening duct work seams on your warm air and air conditioning jobs.

Capacity—3 thicknesses of 18 ga. mild steel.

Length overall—24".

Weight—9 lbs.

Write for all the facts on this superior clip punch now.

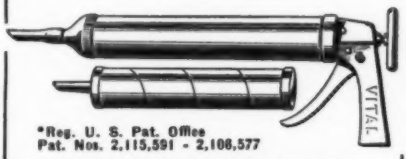
Davis & Son Machine Works

8428 Compton Ave.

Los Angeles 1, Calif.

Specify VITAL Caulking Guns* and Cartridges*

from your Wholesaler Since 1909



*Reg. U. S. Pat. Office Pat. Nos. 2,115,591 - 2,106,577

THE VITAL PRODUCTS MFG. CO.

7500 Quincy Ave., Cleveland 4, Ohio

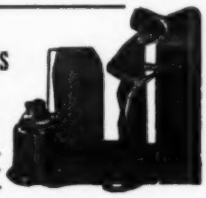
GRAND RAPIDS FURNACE CLEANERS

Write for Details

DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W.

GrandRapids7,Mich.



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- **EQUIPMENT**
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AMERICAN ARTISAN

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Classified

SITUATIONS OPEN

WANTED—Benchman, thoroughly experienced in layout of round and rectangular ducts, cyclones, etc. for ventilating, air conditioning, dust collecting and miscellaneous sheet metal products; no roofing. Good salary and steady employment for right man in largest sheet metal fabricating concern in our State. Address Key # 652, American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

Midwest Machinery Builder seeks experienced engineer who can design and perhaps assist in introductory selling of line of Dust Collectors for use with grinders, buffers, etc. Address Key # 650, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

Wanted: Engineer to act as chief of research development and application design of light duty domestic air conditioning, oil burner and evaporative cooling blowers. Capable of consulting with manufacturing customers of heating and/or cooling equipment as well as guiding basic research of air handling equipment. State in letter of application complete historical record of training and experience. Address Key # 651. American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

AGENCIES

Factory Representatives
Certain Territories Open To Sell
Conversion Burners & Heating Equipment.
Address B. I. Corporation
2054 National Bank Bldg.
Detroit 26, Michigan

FOR SALE

GAS—GAS

Conversion Burners A.G.A. Approved. 3 year Guarantee. Heavy Cast Iron Heat Exchanger. $72.00 Complete — ANY GAS. Immediate Delivery.

JAYS—1938 State St., Granite City, Ill.

ROOFING MOPS. Made of slasher Roofing yarn Made on 72 inch handle 1⅛ inch handle—$15.00 Dozen freight paid on three dozen or more. Special prices to Jobbers in quantity lots. All shipments made C.O.D. Mail certified check on all foreign country orders. Can make delivery at once. Moody Broom Mop Supply, 526 Wood Avenue, Waco, Texas.

New! Outside metal venetian blind. Louvres fold and tilt from within with window closed. Legal, any type building. Saves heat. Storm, burglar, mob proof. Not on market. Drawing $20. from inventor. E. R. Carroll, 3203½ Lemmon Ave., Dallas, Texas.

WANTED

WANTED—Used tin shop and sheet metal machines or equipment. Describe fully and state price. Private party. Erwin Rohde, 3221 No. Pontiac Ave., Chicago, Ill.

WANTED — Shearings any amount — all sizes. Galvanized, cold and hot rolled aluminum. Stainless and copper 6" minimum width to 36" minimum length, uniform quantities. Gauges from 16 to 30 inclusive.

Write or wire
Los Angeles Sheet Metal Mfg. Co.
901-903 East 9th Street
Los Angeles 21, Calif.
Trinity 4713

★ ★ ★ AMERICAN ARTISAN Service Section ★ ★ ★

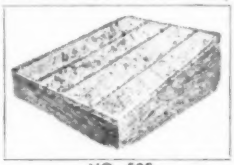
ALL STYLES SKYLIGHTS ALL SIZES

WILLIS SKYLIGHTS are designed to give a maximum of light with perfect ventilation. Constant improvement for over forty years, guarantees WILLIS customers greater value, both in construction and workmanship.

Willis skylights are constructed with condensation gutters on all bars and at the eaves to carry away the moisture. They are water-tight without the use of putty and are easily installed on old or new buildings.

Our engineering department will be glad to assist you in your skylight problems.

NO. 70S



NO. 50S

SEND FOR CATALOG

WILLIS STEEL CORPORATION — — Galesburg, Illinois

156 NO. ACADEMY ST.

SPECIAL SPECIAL SPECIAL

One Horse Power Furnace Vacuum Cleaner with 11 attachments	$115.00
Oil Burners complete with 3 Minneapolis-Honeywell controls . . . each	165.00
Conversion Gas Burners, Fully Automatic. Complete with controls—AGA Approved—80 to 175,000 B.T.U.	86.67
up to 300,000 B.T.U.	95.33
Hasko Stainless Steel Nozzles with Strainers, Best Grade, Accurate	1.00
Hasko Fuel Oil Gauges, Reading in Gallons, for 275 Gallon Inside Tanks	1.80
Hasko Stack Thermometer—Complete with Metal Case	2.95
FREE—Large Soot Gun with purchase of 12 pkgs. (1 case) Soot destroyer	9.00

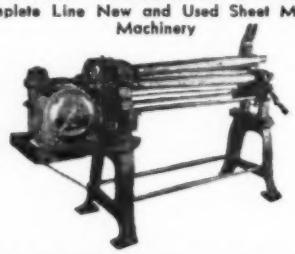
Request list of oil burner and stoker Specialties.

HASKO UTILITIES COMPANY

119-121 East 27th Street New York Ci'y, 16, N.Y.

In Stock—Immediate Delivery

Complete Line New and Used Sheet Metal Machinery



MILTON SLIP ROLL FORMING MACHINES

These machines are new and of our own manufacture. 10 ga. and lighter. 3' to 10' long. Compact, heavy duty, conservatively rated. Power or hand operation. Milton geared slitting shears —new—capacity 3/16 iron and lighter. Length of cutting blades 10 in. Dealer representatives wanted.

MILTON EQUIPMENT CO.

402-08 Race St. Philadelphia 6, Pa.

POTTS SERVICE

consists of the warehousing and selling of the following and many other products:

METAL WORKING MACHINERY AND TOOLS

COPPER — Sheets, Rolls, Nails, Tubing, Pipe, Trough, Accessories.

ERAYDO — Copper Hardened Zinc Sheets, Rolls, Pipe, Trough, Roof Edgings, etc.

STAINLESS STEEL—Sheets, Nails, Tubing, Bars.

ALUMINUM—5V-Crimp and Corrugated Roofing.

SOLDER—Potts Quality.

CHROMALOID & NICKELOID—Zinc Sheets.

OTISCOLOY — Manganese and Copper Content Sheets, Angles, Flats, Rounds.

REGISTERS — GRILLES — ASBESTOS PAPER.

NAILS—All kinds for all purposes.

PHONE — WIRE — WRITE

W. F. POTTS, SON & CO., INC.

1224 Cherry Street
Philadelphia 7, Pa.

The Williams WALL WARMOLATOR

for new residences
For Natural, Manufactured or Butane Gas

Dual type. 45,000 B.T.U. input. Color, light ivory. For 2 x 4 studs. Automatic temperature control with Wall Thermostat or for manual control with pilot lighter.

Easily installed. — Easily accessible. No pit or basement. Approved by A.G.A. Eligible for F.H.A. loans.

Size of face 25¼" wide, 50" high. Size of recess in walls, 23¾" x 48" high. Projects from wall, 4 inches.

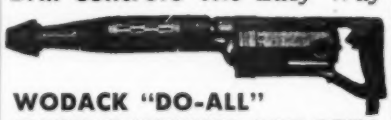
Ask for Circular, Form 211

WILLIAMS RADIATOR COMPANY

"Sponsors of better heating since 1916"

Sales Office: 3115 Beverly Blvd., Los Angeles 4, Cal.
Factory: 1821 Flower St., Glendale 1, Cal.

Drill Concrete *the Easy Way*



WODACK "DO-ALL" ELECTRIC HAMMER AND DRILL

Saves time and money installing expansion anchors. Drills concrete to 1⅜" dia., metal to ⅜". Two tools in one. Easy to maintain. Universal motor. Star drills in 17 diameters. Also chisels, bull points, etc. Write for bulletin No. 644.

Wodack Electric Tool Corporation
4627 W. Huron St. Chicago 44, Ill.
Telephone AUstin 9866

HARDENED STEEL PINS

Send 25c for sample
William Scheck
353 Shaler Blvd.
Ridgefield, N. J.

TOOLS for the ROOFING CONTRACTOR

ASBESTOS SHINGLE CUTTERS
AXES
BEAMS
BRACKETS
BROOMS
BUCKETS
CALKING GUNS
CALKING CEMENT
DIPPERS
HATCHETS
HOISTS—PORTABLE
HOISTING WHEELS
HOOKS
INSULBRIC CUTTERS
KETTLES
KNIVES
LADDERS
LADDER JACKS
KNOT BRUSHES
MOPS: JEWEL, FREY PATENT, CABLE CORD, SOFT YARN
MOP BELLS
MOP HANDLES
NAILS, CONCRETE
ROPE
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SLATERS' TOOLS
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WHEELBARROWS

FRANK P. FREY & CO.

2634 W. MADISON STREET CHICAGO, ILLINOIS

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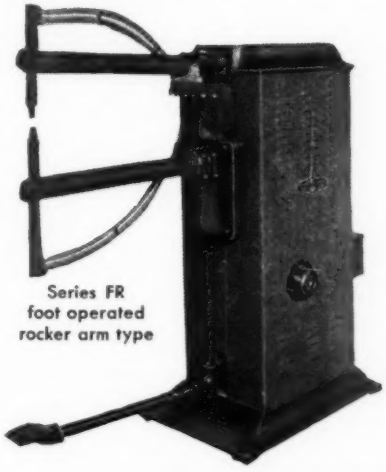
NEW REX WELDERS

Immediate delivery from stock upon receipt of order



Series FR
foot operated
rocker arm type

*SERIES	KVA	STANDARD THROAT DEPTH INCHES	APPROX. SHIPPING WEIGHT CRATED LBS.	PRICE F.O.B. CHICAGO
BR	5	12	285	$ 253.00
BR	10	18	360	346.00
FR	5	12	285	253.00
FR	7½	16	460	281.00
FR	10	18	780	351.00
FR	15	18	850	384.00
FR	15	30	850	410.40
FR	20	18	900	428.00
FR	30	20	1,360	522.00
FR	40	20	1,425	610.00
FR	50	20	1,455	720.00
FP	7½	16	430	313.00
AR	10	18	900	587.50
AR	20	18	950	664.50
AR	30	20	1,375	769.50
AR	40	20	1,450	857.50
ASP	100	20	3,125	1,613.50

*BR—Bench Model (Rocker Arm)
FR—Foot Operated (Rocker Arm)
FP—Foot Operated Press Type
AR—Air Operated Rocker Arm
ASP—Air Operated Solenoid Press Type

PRICES SUBJECT TO ESCALATOR CLAUSE

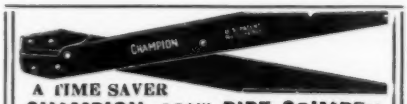
OFFERED SUBJECT TO PRIOR SALE

Phone Yards 5800

Send for Free Copy of Our Machinery "Mart"

INTERSTATE Machinery Co., Inc.

1433 W. PERSHING RD., CHICAGO 9, ILL.



A TIME SAVER

CHAMPION DRAW ACTION PIPE CRIMPER

Length—14 Inches
Weight—one lb. 10 ozs.

Crimps plain round, square and rectangular pipe—quickly, perfectly and easily. Can be used in the shop or carried conveniently in the tool kit to outside jobs. Appreciated by those who install warm air furnace pipe, wall stacks, air ducts, smoke, conductor and water heater vent pipe, etc. Price $3.00 f.o.b. Factory. A tool of real merit, in fact "it's clever."

Jobbers and Installers:
Write for full details today

CHAMPION TOOL COMPANY
376 West 41st Place, Los Angeles 37, Calif.

Improved Super Drill Grinder

Sharpens round shank drills from 3-32" to 1 1-16" diameter. GRINDS OLD DRILLS LIKE NEW IN 4 DIFFERENT DRILL POINT ANGLES. GRINDS SHORT, MEDIUM AND LONG TWIST DRILLS FROM 1½" UP TO 11" LONG. FOR HAND OR POWER GRINDING WHEELS.

WORKMEN GRIND THEIR DRILLS LIKE FACTORY IN 25 SECONDS. Gives perfect center and clearance. Saves Drills, time and money. No shop should be without the Super Drill Grinder. Guaranteed to do the work or money back. The grinder that gives a rounded point! Mail check or money order with printed address. Your SUPER DRILL GRINDER will come by return mail, postage paid. Only $2.95.

CRANDALL MFG. CO.
Dept. ATA-1, 1512 W. Slauson, Los Angeles 44, Calif.

PRINTED TAPE

— For "Parts" Marking —

TOPFLIGHT TOOL CO.
Huber Bldg., York, Pa.

HANDY TOOLS and EQUIPMENT

Available for Prompt Shipment

A DRIVE CLEAT NOTCHER

For notching drive cleats up to 3 in. in width, 22-ga. or lighter. Can be operated by hand or foot or can be easily mounted on the bench or on the job with clamps or bolts and screws.

When writing, ask for particulars about the most up-to-date soldering equipment that will cut your soldering costs in half, also ask about Quick Set Dividers.

A NEW CLIP PUNCH

For fastening slips or seams on ducts. Will push a "half moon" through 3 thicknesses of 18-ga. steel. No hammering or flattening out to fasten slip to the duct.

Distributed exclusively by
REINER & CAMPBELL CO., Inc.
671 Norwood Terrace, Elizabeth 2, N. J.

Accurate Revolving Ventilators

For Better Chimney Draft and Better Heater Performance Use Accurate Revolving Ventilators.

Positively Prevents Down Draft

Simple in Design

Durable in Construction

Storm and Rain Proof

Also Ideal for Poultry Houses, Dairies, Schools, Factories and Homes. Easy to Install and Provides Economical Ventilation.

No finer Ventilator can be obtained at any price. Proven certified rate. Simple, sturdy. Accurate and Dependable.—LOW PRICED.

SEND FOR LITERATURE TODAY

Can now add a few more Jobbers to our list.

Accurate Sheet Metal Mfg. Works
2336-38 Milwaukee Avenue-Chicago 47, Ill.

Dowagiac "AUTOMATIC"

HEATING EQUIPMENT . . .

WARMS

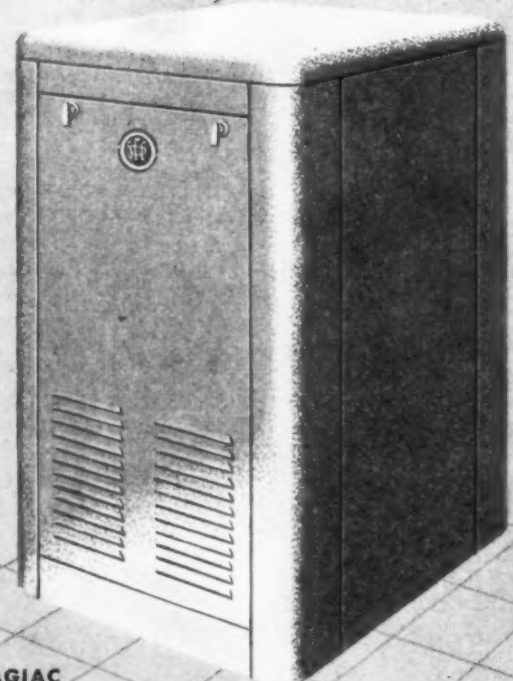
CIRCULATES

HUMIDIFIES

FILTERS

at a mere touch of your finger!

Today's discriminating dealer appreciates only the finest in heating equipment. We have retained every worth-while feature of a line that carries a proud name and to meet the demand for the world's most wanted heating units of all types we present our Oil-Burning and Gas Furnaces, Oil and Electric Water Heaters—units that are setting new standards of engineering and performance. There is no finer quality to be found anywhere in the industry than in Dowagiac Steel Furnace Company's heating equipment



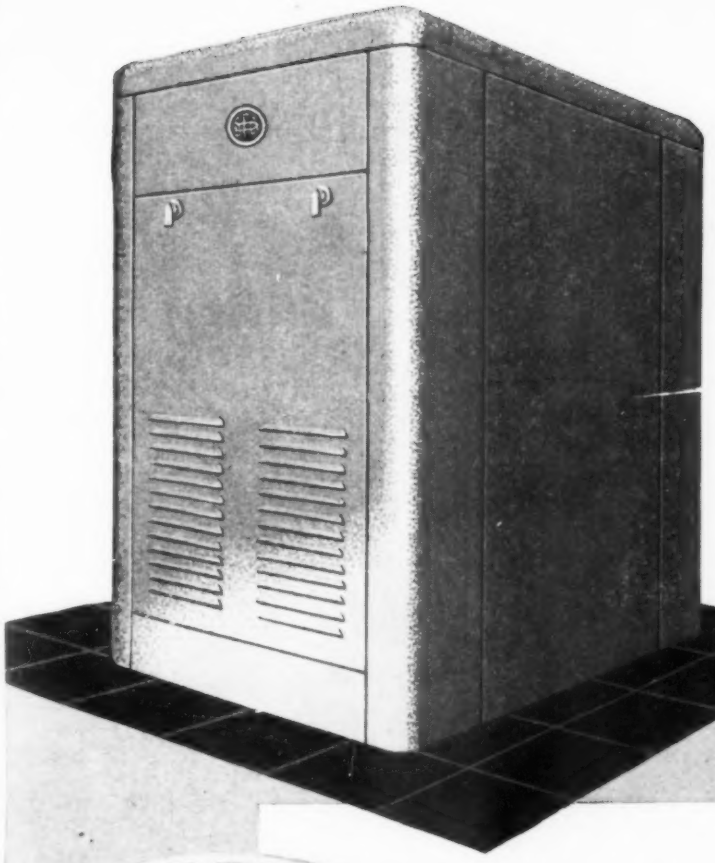
DOWAGIAC ARROW GAS-FIRED WINTER AIR CONDITIONER

The Arrow Gas Furnace is built for economy and lasting service. It is quiet and dependable—no noisy moving parts. Built into one complete, compact unit with casing beautifullly finished in blue Hammerloid baked enamel that appeals instantly to those desiring the satisfaction of an up-to-date, colorful basement or recreation room. The correct construction of the Dowagiac Arrow won for it the approval of the American Gas Association, whose label the unit merits.

DOWAGIAC

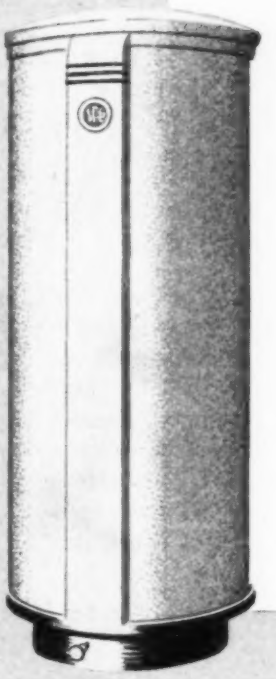
DOWAGIAC MICHIGAN

Steel Furnace Company



DOWAGIAC MIGHTY MIDGET

Complete, compact oil-burning unit. Modern construction affords much less space than gravity installations require. The casing which is beautifully finished in blue Hammerloid baked enamel houses the oil burner, furnace, blower, filters and controls. The Mighty Midget Unit incorporates a long fire travel and has ample heating surface to extract the heat units. The unit is so shaped that the air which is forced into the warm air chamber by the efficient blower will impinge on the hot surfaces of the heat exchanger, thus removing the heat released by combustion, making it available for distribution throughout your home. This unit provides positive circulation.

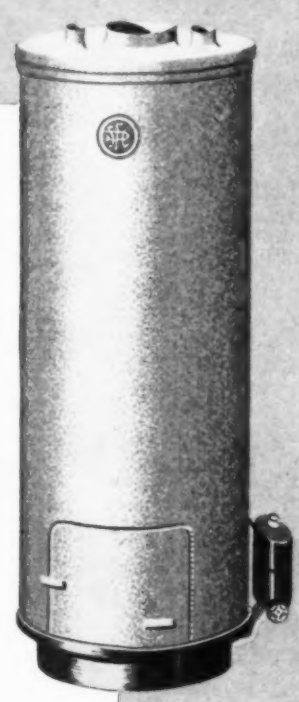


DOWAGIAC ELECTRIC WATER HEATER

The Dowagiac Electric Water Heater is the result of the untiring efforts of our water heater engineers to advance the standards of electric heater construction. Water temperatures are accurately controlled. Thick walls of insulation surround the storage tank, to protect the hot water against heat loss. Finished in attractive white, durable baked enamel the Dowagiac Electric Water Heater will meet accurately the most exacting requirements.

DOWAGIAC OIL-BURNING WATER HEATER

The "Dowagiac" Oil-Burning Water Heater is designed to give satisfactory operation year after year with little or no attention from the dealer or owner. Old fashioned water heaters and old fashioned methods of heating water are being rapidly replaced by up-to-date, money-saving equipment. It is easy to see why the Dowagiac Oil-Burning Water Heater is a leader in its line.



Although our production of heating units has kept pace with the times, appearance and economy have remained a matter of great pride with the Dowagiac Steel Furnace Company—Company pride is a very good guarantee of quality.

ALL YOU NEED TO KNOW ABOUT *FURNACE CEMENT*

. . . is the name

Because all of the guesswork has been taken out of Tharco Asbestos Furnace Cement and because it is scientifically compounded by the secret Armstrong formula from the best materials obtainable to meet every requirement, leading furnace manufacturers and skilled furnace repairmen everywhere say, *"All you need to know about furnace cement is the name, Tharco."*

Tharco Asbestos Furnace Cement works easily and has a high degree of adhesion and heat resistance. Every container of Tharco is guaranteed to meet the toughest conditions of furnace operation without shinkage, checking or powdering. Tharco laboratory and field research plus continuous production testing make Tharco your best furnace cement bet. Use it always!

Write for your free copy of the valuable folder: "The Proper Use and Care of Furnace Cement."

THE ARMSTRONG COMPANY

241 SOUTH POST AVENUE
DETROIT 17

4065 SOUTH LA SALLE STREET
CHICAGO 9

319 SOUTH CROWDUS STREET
DALLAS 1

Section of

JANUARY, 1947

AMERICAN ARTISAN

1947 DIRECTORY

OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

Section 1.—Products Classified . . . . . Page 274

If you want to know the names of one or more manufacturers making a certain product, look in Section 1, where products are classified alphabetically in directory style with the noun governing (for instance, Warm Air Furnaces are listed as Furnaces, Warm Air).

Section 2.—Trade Names . . . . . Page 324

If you have the trade name of a product and want to know who manufactures it, look in Section 2, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be readily identified under their product classifications in Section 1.

Section 3.—Manufacturers' Addresses . . . . Page 340

For the complete name and address of any manufacturer, look in Section 3.

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, pages 355-356, for the page on which you will find the advertising of any of these manufacturers.

Section of

American Artisan

1947 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section I — PRODUCTS CLASSIFIED]

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, pages 355-356, for the page on which you will find the advertising of any of these manufacturers.

ADSORBERS, ODOR

Airkem, Inc., New York City (Air Freshening Compounds).
Betz Corp., Hammond, Ind.
Carbide & Carbon Chemicals Corp., New York City.
Connor Engineering Corp., W. B., New York City.
Refinite Corp., Omaha, Nebr.

AIR CONDITIONING FURNACES

See Furnaces, Warm Air, Air Conditioning

AIR CONDITIONING UNITS, CENTRAL PLANT, SUMMER

(Self-contained fan, filter and cooling coil unit for connection to refrigerating compressor or cold water supply with duct distribution of air)

Air & Refrigeration Corporation, New York City.
● Airtemp Division, Chrysler Corp., Dayton, O.
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Buffalo Forge Co., Buffalo.
Carrier Corp., Syracuse, N. Y.
● Clarage Fan Co., Kalamazoo, Mich.
Conditionaire Unit Co., Chicago.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Drayer-Hanson, Inc., Los Angeles.
Frigidaire Division, General Motors Corp., Dayton, O.
General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Governair Corp., Oklahoma City, Okla.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Howe Ice Machine Co., Chicago.
Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Lennox Furnace Co., Marshalltown, Ia.
McQuay, Inc., Minneapolis.
Marlo Coil Co., St. Louis.
Micheli Air Conditioning Co., Inc., Schenectady, N. Y.
Niagara Blower Co., New York City.
Peerless of America, Inc., Chicago.
Pernot & Rich, Inc., Los Angeles.
● Premier Furnace Co., Dowagiac, Mich.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
● U. S. Air Conditioning Corp., Minneapolis.
Vilter Manufacturing Co., Milwaukee.
Williams Oil-O-Matic, Div. Eureka Williams Corporation, Bloomington, Ill.
Worthington Pump & Machinery Corp., Harrison, N. J.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, CENTRAL PLANT, WINTER, SPLIT SYSTEM TYPE

(Self-contained fan, filter, humidifier and heating coil unit for connection to steam or hot water boiler with duct distribution of air)

Air & Refrigeration Corporation, New York City.
● Airtemp Division, Chrysler Corp., Dayton, O.
Aladdin Heating Corp., Oakland, Calif.
Allis-Chalmers Manufacturing Co., Milwaukee.
American Blower Corp., Detroit.
Buffalo Forge Co., Buffalo.
Carrier Corp., Syracuse, N. Y.
● Clarage Fan Co., Kalamazoo, Mich.
● Certified Furnace Company, St. Paul, Minn.
General Electric Co., Bloomfield, N. J.
Handelan Washed Air Co., Minneapolis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.
Johnson Co., S. T., Oakland, Calif., and Philadelphia.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
McQuay, Inc., Minneapolis.
Marlo Coil Co., St. Louis
● Mayflower Air Conditioners, Inc., St. Paul.
New York Blower Co., Chicago.
Niagara Blower Co., New York City.
Peerless of America, Inc., Chicago.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Economics Co., Inc., Canton, O.
Richmond Radiator Co., New York City.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
● U. S. Air Conditioning Corp., Minneapolis.
Western Blower Co., Seattle, Wash.
Williams Oil-O-Matic, Div. Eureka Williams Corporation, Bloomington, Ill.
Worthington Pump & Machinery Corp., Harrison, N. J.
York-Heat Div. York-Shipley, Inc., York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, EVAPORATIVE TYPE, SUMMER

(For cooling with sprays, no dehumidification)

Air & Refrigeration Corp., New York City.
● Alton Manufacturing Co., Dallas, Tex.
American Blower Corporation, Detroit.
American Cooling Tower Co., Kansas City.
● American Metal Products, Fort Worth, Tex.
April Showers Co., Washington, D. C. (Roof Spray).
Aqua-Mist Co., Topeka, Kans.
Bien Air Conditioning Company, Bell, Calif.
Campbell Heating Co., E. K., Kansas City.
Carrier Corporation, Syracuse, N. Y.
Dallas Engineering Co., Inc., Dallas, Tex.
Essick Manufacturing Co., Los Angeles.
Farr Company, Los Angeles.
Goettl Bros., Phoenix, Ariz.
● Great National Air Conditioning Corp., Dallas, Tex.
● International Metal Products Company, Phoenix, Ariz.
International Sales Co., San Francisco.
Little Giant Vaporizer Co., Oklahoma City.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver, Colo.
National Engineering & Manufacturing Co., Kansas City, Mo.
● Palmer Manufacturing Corp., Phoenix, Ariz.
Pernot & Rich, Inc., Los Angeles.
Reynolds Manufacturing Co., Springfield, Mo.
● Rheem Manufacturing Co., New York City.
Stewart Company, W. H., Oklahoma City, Okla.
● U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Western Blower Co., Seattle, Wash.
York Corporation, York, Pa.

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

(Self-contained blower, coil, filter unit for connection to remote compressor or cold water supply)

American Coils, Inc., Newark, N. J.
• Airtemp Division, Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
General Electric Co., Bloomfield, N. J.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Mfg. Co., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
King Co., Owatonna, Minn.
McQuay, Inc., Minneapolis.
Peerless of America, Inc., Chicago.
• Premier Furnace Co., Dowagiac, Mich.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Scott-Newcomb, Inc., St. Louis.
Trane Company, La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
Worthington Pump & Machinery Corp., Harrison, N. J.
York Corp., York, Pa.

AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, UNDER 3 H. P.

(Self-contained blower, coils, compressor and filter unit)

• Airtemp Division, Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
General Electric Co., Bloomfield, N. J.
Ilg Electric Ventilating Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Pacific Manufacturing Corporation, Cleveland (Window).
Peerless of America, Inc., Chicago.
Pleasantaire Corp., Washington, D. C.
• Premier Furnace Co., Dowagiac, Mich.
Remington Air Conditioning Div., Remington Corporation, Cortland, N. Y.
Scott-Newcomb, Inc., St. Louis.
Viking Manufacturing Corporation, Cleveland.
York Corp., York, Pa.

AIR CONDITIONING UNITS, ROOM TYPE, WINTER, FLOOR CABINET

(Self-contained blower, filter, heating coil, humidifier unit for connection to remote boiler)

Carrier Corp., Syracuse, N. Y.
• Clarage Fan Company, Kalamazoo, Mich.
General Electric Co., Bloomfield, N. J.
Ilg Electric Ventilating Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kehm Corporation, Chicago.
Kennard Corporation, St. Louis.
McQuay, Inc., Minneapolis.
Peerless of America, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Richmond Radiator Co., New York City.
Somers, Inc., H. J., Detroit.
Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
• U. S. Air Conditioning Corp., Minneapolis.

AIR CONDITIONING UNITS, ROOM TYPE, YEAR AROUND, FLOOR CABINET

(Self-contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply and steam or hot water)

• Airtemp Division, Chrysler Corp., Dayton, O.
American Coils, Inc., Newark, N. J.
Carrier Corp., Syracuse, N. Y.
• Clarage Fan Co., Kalamazoo, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Drayer-Hanson, Inc., Los Angeles.
General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
McQuay, Inc., Minneapolis, Minn.
Marlo Coil Co., St. Louis.
Niagara Blower Co., New York City.
Peerless of America, Inc., Chicago.
Pfening Co., Fred D., Columbus, O. (Industrial Bakery).
Refrigeration Economics Co., Inc., Canton, O.
Trane Co., La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
• United States Air Conditioning Corporation, Minneapolis.
York Corp., York, Pa.

AIR CONDITIONING UNITS, STORE TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, 3 H. P. AND OVER

(Self-contained blower, coil, compressor, filter unit, with air discharge approximately 6 ft. above floor)

• Airtemp Division, Chrysler Corp., Dayton, O.
American Thermal Industries, Detroit.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Brunner Manufacturing Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
• Clarage Fan Company, Kalamazoo, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
General Engineering & Manufacturing Co., St. Louis.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Governair Corporation, Oklahoma City, Okla.
Ice Air Conditioning Co., Inc., Brooklyn, N. Y.
Kauffman Air Conditioning Corp., St. Louis.
Nevinger Manufacturing Co., Inc., Greenville, Ill.
Peerless of America, Inc., Chicago.
Refrigeration Appliances, Inc., Chicago.
Scott-Newcomb, Inc., St. Louis, Mo.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Trane Company, LaCrosse, Wis.
• United States Air Conditioning Corporation, Minneapolis.
Viking Manufacturing Corp., Cleveland.
Worthington Pump & Machinery Corp., Harrison, N. J.
York Corp., York, Pa.

AIR DIFFUSERS

See Diffusers, Air

AIR FILTERS

See Filters, Air

AIR METERS

See Meters, Air Velocity, Direct Reading

AIR WASHERS

See Washers, Air

ANALYZERS, CO_2, PORTABLE

• Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Defender Instrument and Regulator Co., St. Louis.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Engelhard, Inc., Chas. East Newark, N. J.
General Scientific Equipment Co., Philadelphia.
Hays Corp., Michigan City, Ind.
Huyette Co., Inc., Paul B., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Uehling Instrument Co., Paterson, N. J.

ANEMOMETERS

American Instrument Co., Silver Spring, Md.
Detroit Air Conditioning Service Co., Inc., Detroit.
Friez Instrument Div., Towson, Md.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.
Willson Products, Inc., Reading, Pa. (Thermometer).

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Alden Mfg. Co., Painesville, O.
Allegheny Ludlum Steel Corporation, Pittsburgh.
Aluminum Co. of America, Pittsburgh.
• American Brass Co., Waterbury, Conn.
• American Rolling Mill Company, Middletown, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Brasco Manufacturing Co., Harvey, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron structural shapes).
Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Columbia Steel Co., San Francisco.
Dahlstrom Metallic Door Co., Jamestown, N. Y. (Angles, Channels).

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Decatur Iron & Steel Co., Decatur, Ala.
Dow Chemical Co., Midland, Mich.
Harvey Machine Co., Inc., Torrance, Calif.
Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh.
Kawneer Company, Niles, Mich.
Laclede Steel Co., St. Louis.
● Milcor Steel Co., Milwaukee.
● Republic Steel Corp., Cleveland.
● Revere Copper & Brass, Incorporated, New York City.
Sioux Steel Co., Sioux Falls, S. D.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Truscon Steel Co., Youngstown, O.
● Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ARC WELDERS

See Welders, Arc

ARC WELDING ELECTRODES

See Electrodes, Arc Welding

ASBESTOS BOARD

See Board, Duct, Asbestos

ASBESTOS PAPER

See Paper, Asbestos

ATTIC FANS

See Fans, Night Air Cooling

ATTIC FURNACES

See Furnaces, Warm Air, Air Conditioning for Attic Installation

AUTOMATIC HUMIDIFIERS

See Humidifiers, Furnace, Evaporation, Spray

BAFFLES, COMBUSTION CHAMBER, OIL BURNER AND STOKER

● Air Devices, Inc., New York City.
Commonwealth Products Co., Philadelphia.
Harvey, Inc., Sid, Valley Stream, N. Y.
Laclede-Christy Clay Products Co., St. Louis.
Munn & Steele, Inc., Newark, N. J. (Stoker).
Peterson Co., B. A., Dowagiac, Mich.
Quigley Co., Inc., New York City.

BALANCING EQUIPMENT FOR FANS

Bear Mfg. Co., Rock Island, Ill.
Gisholt Machine Co., Madison, Wis.

BAND SAWS

See Saws, Band, Sheet Metal Cutting

BAR FOLDERS

See Machines, Bar Folders

BARS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

BASES AND PADS, VIBRATION ISOLATING

Buffalo Forge Co., Buffalo.
● Clarage Fan Company, Kalamazoo, Mich.
Cork Import Corp., Englewood, N. J.
Cork Insulation Co., Inc., New York City.
Ehret Magnesia Manufacturing Co., Valley Forge, Pa.
Felters Co., Boston.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co. Sales Div., Inc., Denver, Colo.
Goodrich Co., B. F., Akron, Ohio.
Hobsite Products Co., Inc., New York City.
Johns-Manville, New York City.
Korfund Co., Inc., Long Island City, N. Y.
Lord Mfg. Co., Erie, Pa.
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
Mundet Cork Corp., Brooklyn, N. Y.
National Lead Co., New York City.
Robinson Aviation, Inc., Teterboro, N. J.
Sponge Rubber Products Co., Shelton, Conn.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York City.
Vibration Eliminator Co., Long Island City, N. Y. (Cork and Rubber).
Western Felt Works, Chicago (Felt).

BATHS, TINNING

Eclipse Fuel Engineering Co., Rockford, Ill.
Farrelloy Co., Inc., Philadelphia.
Retinning Manufacturing Co., Chicago.

BEADERS

See Machines, Beading

BEAMS

See Angles, Bars, Beams, Channels and Tees (Light weight shapes)

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago.
● Air Controls, Inc., Cleveland.
Anti-Friction Bearings Company, Los Angeles.
Chain Belt Co., Milwaukee.
Chicago Die Casting Co., Chicago.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., New Britain, Conn.
Freed Products Co., Moline, Ill.
Goldens' Fdry. & Machine Co., Columbus, Ga.
Jones Foundry & Machine Co., W. A., Chicago.
● Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago.
Norma-Hoffmann Bearing Corp., Stamford, Conn.
● Randall Graphite Products Corp., Chicago.
Royersford Foundry & Machine Co., Royersford, Pa.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.
Standard Pressed Steel Co., Jenkintown, Pa.
Stephens-Adamson Mfg. Co., Aurora, Ill.
● Triangle Manufacturing Co., Oshkosh, Wis.
● Viking Air Conditioning Corp., Cleveland.
Wood's Sons Co., T. B., Chambersburg, Pa.

BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Belting Co., Chicago.
Dayton Rubber Mfg. Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Manufacturing Corp., Mishawaka, Ind.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co., Denver, Colo.
Gilmer Co., L. H., Philadelphia, Pa.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Inc., Akron, O.
Ideal Industries, Inc., Sycamore, Ill.
Jones Foundry & Machine Co., W. A., Chicago.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.
Manheim Mfg. & Belting Co., Manheim, Pa. (Adjustable).
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rockwood Manufacturing Co., Indianapolis.
Thermoid Rubber Div. of Thermoid Co., Trenton, N. J.
United States Rubber Co., New York City.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

BENDERS, ANGLE, ETC.

Bath Company, Cyril, Cleveland (Contour formers).
Champion Blower & Forge Co., Lancaster, Pa.
Excelsior Tool & Machine Co., East St. Louis, Ill. (Circular bending).
Hendley & Whittemore Co., Beloit, Wis.
● Hossfield Mfg. Co., Winona, Minn.
Kane & Roach, Inc., Syracuse, N. Y.
Kling Bros. Engineering Works, Chicago.
● Knights Co., James, Sandwich, Ill.
Martens & Stormoen, Boston.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pedrick Tool & Machine Co., Philadelphia.
Thomas Machine Manufacturing Co., Pittsburgh.
Whitney Metal Tool Co., Rockford, Ill.

BLADES, PROPELLER FAN

Ackermann Manufacturing Co., Wheeling, W. Va.
Aerovent Fan Co., Piqua, O.
● Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
● Burden Co., Los Angeles.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Products, Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.

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Dallas Engineering Co., Inc., Dallas, Tex.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dual-Air Fan Corp., Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago.
Goettl Bros., Phoenix, Ariz.
Howry-Berg Steel & Iron Works, Denver, Colo.
Joy Manufacturing Co., LaDel Div., New Philadelphia, O.
• Lakewood Engineering & Mfg. Co., Chicago.
Martin Fan & Blower Co., Chicago.
Meier Electric & Machine Co., Indianapolis, Ind.
Motionair Company, Los Angeles.
Myers Electric Co., Pittsburgh.
Nationalaire Corporation, Detroit.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Roto-Beam Div., Peerless of America, Chicago.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Swift Manufacturing Company, Detroit.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., Torrington, Conn.
Utility Appliance Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.

BLAST GATES

• Berger Bros. Co., Philadelphia.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
• Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis.
Goethel Sheet Metal Works, Alfred, Milwaukee.
Kirk & Blum Mfg. Co., Cincinnati.
Maysteel Products, Inc., Milwaukee.
Newcomb Engineering Co., Grand Rapids, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
R-S Products Corp., Philadelphia.
Spencer Turbine Co., Hartford, Conn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee.

BLOWER—FILTER UNITS

(Separate Conversion Units for Warm Air Furnaces)

Advance Furnace Company, Wichita, Kans.
Agricola Furnace Co., Inc., Gadsden, Ala.
Air Conditioning Equipment Co., Minneapolis.
• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., Cleveland.
Airwasher Corporation, Eaton Rapids, Mich.
Aladdin Heating Corporation, Oakland, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
• American Machine Products Co., Marshalltown, Ia.
• American Radiator & Standard Sanitary Corp., Pittsburgh.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Atlas Heating and Ventilating Co., San Francisco.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
• Bishop & Babcock Mfg. Co., Cleveland.
Bovee Furnace Works, Waterloo, Ia.
• Brundage Co., Kalamazoo, Mich.
Campbell Heating Co., Des Moines, Ia.
• Char-Gale Mfg. Co., Minneapolis.
• Cleveland Steel Products Corp., Toridheet Div., Cleveland.
• Conco Engineering Works, Mendota, Ill.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Furbio Co., Hermansville, Mich.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis.
• Harvey-Whipple, Inc., Springfield, Mass.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Henry Furnace Co., Medina, O.
• Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater, Mich.
International Sales Co., San Francisco.
• Jackson & Church Co., Saginaw, Mich.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Kelsey Heating Co., Syracuse, N. Y.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
Martin Fan & Blower Co., Chicago.
• Mayflower Air Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
• Naco Manufacturing Co., Huntington Park, Calif.
Northwest Foundry & Furnace Co., Inc., Portland, Ore.
• Olsen Mfg. Co., C. A., Elyria, O.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Payne Furnace Co., Beverly Hills, Calif.
Peerless Electric Co., Warren, O.
• Peerless Foundry Co., Indianapolis.
Pennsylvania Furnace & Iron Co., Warren, Pa.
• Premier Furnace Co., Dowagiac, Mich.
• Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Security Manufacturing Co., Kansas City, Mo.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Western Blower Co., Seattle, Wash.
• Williamson Heater Co., Cincinnati.

BLOWER HOUSINGS

See Housings, Blower

BLOWER-WASHER UNITS, FOR CLEANING OR HUMIDIFYING

(Separate Conversion Units for Warm Air Furnaces)

Air Stream Filter Corp., St. Louis.
Airwasher Corporation, Eaton Rapids, Mich.
American Blower Corporation, Detroit.
• American Machine Products Co., Marshalltown, Ia.
Arcweld Mfg. Co., Inc., Seattle, Wash.
• Bishop & Babcock Mfg. Co., Cleveland.
Furbio Company, Hermansville, Mich.
• Hess Warming & Ventilating Co., Chicago.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
National Engineering & Manufacturing Co., Kansas City, Mo.
New York Blower Co., Chicago.

BLOWER WHEELS

See Wheels, Blower

BLOWERS, FORCED DRAFT, FOR ASH PIT

American Blower Corp., Detroit.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Champion Products Co., Muskegon, Mich.
• Clarage Fan Co., Kalamazoo, Mich.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
Lehigh Fan & Blower Co., Allentown, Pa.
Martin Fan & Blower Co., Chicago.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Power Engineering Co., Chicago.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Universal Blower Co., Birmingham, Mich.
Wing Mfg. Co., L. J., New York City.

BLOWERS, INDUCED DRAFT, FOR SMOKE PIPE

American Foundry & Furnace Co., Bloomington, Ill.
DeBothezat Fans Division, East Moline, Ill.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
Muncie Gear Works, Muncie, Ind.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.

BLOWERS, FURNACE CENTRIFUGAL

Agricola Furnace Co., Inc., Gadsden, Ala.
Air Conditioning Equipment Co., Minneapolis.
• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., Cleveland.
Airecon Industries, Detroit.
Aladdin Heating Corporation, Oakland, Calif.
American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis, Mo.
• American Machine Products Co., Marshalltown, Ia.
Atlas Heating and Ventilating Co., San Francisco.

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Auburn Burner Co., Auburn, Ind.
• Bishop & Babcock Mfg. Co., Cleveland.
• Brundage Co., Kalamazoo, Mich.
Buffalo Forge Co., Buffalo.
Campbell Heating Co., Des Moines, Ia.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chandler Co., Cedar Rapids, Ia.
Circulators & Devices Mfg. Corp., New York City.
• Clarage Fan Co., Kalamazoo, Mich.
Freed Products Co., Moline, Ill.
• Furblo Co., Hermansville, Mich.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
Goetti Bros., Phoenix, Ariz.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Hess Warming & Ventilating Co., Chicago.
International Sales Co., San Francisco.
Jaden Mfg. Co., Hastings, Nebr.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
• Majestic Co., Huntington, Ind.
Martin Fan & Blower Co., Chicago.
Mauer Engineering, Evanston, Ill.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Morrison Products, Inc., Cleveland.
Mountain States Equipment Company, Denver, Colo.
• Mueller Furnace Co., L. J., Milwaukee.
• Naco Manufacturing Co., Huntington Park, Calif.
New York Blower Co., Chicago.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
• Premier Furnace Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Schwitzer-Cummins Co., Indianapolis.
Security Manufacturing Co., Kansas City, Mo.
• Skuttle Manufacturing Co., Detroit.
Standard Heating Equipment Co., Waterloo, Ia.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
• Trade-Wind Motorfans, Inc., Los Angeles.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Western Blower Co., Seattle, Wash.

BLOWERS, INSULATION

Allen Billmyre Div., Lamson Corp., Mamaroneck, N. Y.
General Blower Co., Morton Grove, Ill.
Insulating Equipment Co., Chicago.
Rotary Compressor Blower Co., Grove City, Pa.
Spencer Turbine Co., Hartford, Conn. (Blower only).
Superior Mfg. Co., Alexandria, Ind.

BLOWERS, VENTILATING SYSTEM

(Capacity 4,000 c.f.m. up)

• Air Controls, Inc., Cleveland.
Aladdin Heating Corporation, Oakland, Calif.
American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
• American Machine Products Company, Marshalltown, Ia.
Atlas Heating and Ventilating Co., San Francisco.
• Bayley Blower Co., Milwaukee.
• Bishop & Babcock Mfg. Co., Cleveland.
• Brundage Co., Kalamazoo, Mich.
Buffalo Forge Co., Buffalo.
Campbell Heating Company, Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Fan & Fin Coil Co., Chicago.
Circulators & Devices Mfg. Corp., New York City.
• Clarage Fan Co., Kalamazoo, Mich.
Coppus Engineering Corp., Worcester, Mass.
DeBothezat Fans Division, American Machine & Metals, Inc., East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago.
• Furblo Co., Hermansville, Mich.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Hartzell Propeller Fan Co., Piqua, O.
Hastings Air Conditioning Company, Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
International Sales Co., San Francisco.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Johnson Fan & Blower Corp., Chicago.
Joy Manufacturing Co., LaDel Div., New Philadelphia, O.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
• Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Martin Fan & Blower Co., Chicago.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver, Colo.
• Naco Manufacturing Co., Huntington Park, Calif.
National Engineering & Manufacturing Co., Kansas City, Mo.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Niagara Blower Co., New York City.
Northern Blower Co., Cleveland.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Power Engineering Co., Chicago.
• Schwitzer-Cummins Co., Indianapolis.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., St. Louis.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Trane Company, LaCrosse, Wis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
Western Blower Co., Seattle, Wash.
Wing Mfg. Co., L. J., New York City.

BLOW PIPE EQUIPMENT

See Blast Gates; Collectors, Blow Pipe; Fittings, Blow Pipe

BOARD, SUBSTITUTE MATERIAL, FOR DUCTS

Acme Asbestos Covering and Flooring Co., Chicago (Asbestos cement).
Carey Mfg. Co., Phillip, Lockland, Cincinnati, Ohio.
Celotex Corporation, Chicago.
Johns-Manville, New York City.
Keasbey & Mattison Company, Ambler, Pa.
Keystone Asphalt Products Co., Chicago.
Masonite Corporation, Chicago.
Ruberoid Co., New York City.
• Sall Mountain Co., Chicago.
United States Gypsum Company, Chicago.
• Wilson, Inc., Grant, Chicago.

BOLTS, EXPANSION

Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., New York City.
Industrial Screw Co., Chicago.
National Lead Co., New York City.
Paine Company, The, Chicago.
Phillips Drill Co., Chicago (Shells).
Rawlplug Company, Inc., New York City.
Rolyan Metal Products, Chicago.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOLTS, TOGGLE AND ANCHOR

Carpenter & Paterson, Inc., East Boston, Mass.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., New York City.
Industrial Screw Co., Chicago.
Paine Company, The, Chicago.
Rawlplug Company, Inc., New York City.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOOSTER FANS

See Fans, Booster

BOOTS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

BRAKES, METAL WORKERS', HAND

• Dreis & Krump Mfg. Co., Chicago.
Excelsior Tool and Machine Co., East St. Louis, Ill.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
O'Neill-Irwin Mfg. Co., Lake City, Minn.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York City.
• Whitney Metal Tool Co., Rockford, Ill.
• Wysong and Miles Co., Greensboro, N. C.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

BRAKES, METAL WORKERS', PORTABLE

- Dreis & Krump Mfg. Co., Chicago.
- Harris, A. R., Hammond, Ind.
  O'Neil-Irwin Mfg. Co., Lake City, Minn.
- Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', POWER

Bath Company, Cyril, Cleveland.
Cincinnati Shaper Co., Cincinnati.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.
- Dreis & Krump Mfg. Co., Chicago.

Heartley Machine & Tool Co., Toledo, O.
Ohl & Co., Geo. A., Newark, N. J.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Verson Allsteel Press Co., Chicago.

Weiss & Co., H., New York City.
- Whitney Metal Tool Co., Rockford, Ill.

BRUSHES, ACID

Eastern States Supply Co., Brooklyn, N. Y.
Lukens Metal Co., Thos. F., Philadelphia.
Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
Potomac Mfg. Co., Philadelphia.
- Schaefer Brush Mfg. Co., Milwaukee (Rustproof).

Weiss & Co., H., New York City.

BRUSHES, FURNACE

Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
- Schaefer Brush Mfg. Co., Milwaukee.

Worcester Brush & Scraper Co., Worcester, Mass.

BUFFERS, GRINDERS, POLISHERS AND SANDERS, ELECTRIC

Albertson & Co., Inc., Sioux City, Iowa.
Baldor Electric Co., St. Louis. (Buffers, grinders)
- Black & Decker Mfg. Co., Towson, Md.

Brown-Brockmeyer Co., Inc., Dayton, O.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York City.
Clark Jr. Electric Co., Jas., Louisville, Ky.
DoAll Company, Minneapolis.
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Haskins Co., R. G., Chicago
Hobart Brothers Company, Troy, O.
Ideal Industries, Inc., Sycamore, Ill. (Grinders)
Independent Pneumatic Tool Co., Chicago.
Jefferson Machine Tool Co., Cincinnati.
Lee Co., K. O. Aberdeen, S. D.
L'Hommedieu & Sons Company, Chas. F., Chicago.
Mall Tool Co., Chicago.
Millers Falls Co., Greenfield, Mass.
Minnesota Mining & Manufacturing Co., St. Paul, Minn.
Misener Mfg. Co., Inc., Syracuse, N. Y.
Reynolds Electric Company, Chicago.
Rotor Tool Company, Cleveland, (Portable).
Skilsaw, Inc., Chicago.
Small Motors, Inc., Chicago. (Grinder)
Snap-on Tools Corp., Kenosha, Wis.
Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Stow Manufacturing Co., Binghamton, N. Y. (Flexible shaft)
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
U. S. Electrical Motors, Inc., Los Angeles. (Buffers)
Van Dorn Electric Tool Co., Towson, Md.
Wyzenbeek & Staff, Inc., Chicago.
York Electric and Machine Company, York, Pa.

BUFFERS, GRINDERS, POLISHERS AND SANDERS, PNEUMATIC

Chicago Pneumatic Tool Company, New York City. (Grinders)
Ideal Commutator Dresser Co., Sycamore, Ill.
Independent Pneumatic Tool Co., Chicago.
Keller Tool Company, Grand Haven, Mich.
Rotor Tool Company, Cleveland. (Portable)

BURNERS, GAS, CONVERSION, RESIDENTIAL

Admas Manufacturing Co., Cleveland.
American Gas Burner, Inc., Indianapolis.
American Heating & Engineering Co., New Albany, Ind.
- American Radiator & Standard Sanitary Corp., Pittsburg.

Anchor Burner Co., Oklahoma City, Okla.
Auburn Burner Co., Auburn, Ind.
Autogas Company, Chicago.
- Automatic Firing Corporation, St. Louis.

Automatic Gas Equipment Co., Pittsburgh.
- Barber Gas Burner Co., Cleveland.

Bard Manufacturing Company, Bryan, Ohio.
Barnes Manufacturing Co., Cleveland.
Barton Co., Minneapolis.
Beck Engineering Combustion Kompany, St. Louis.
Berger Furnace Mfg. Co., Pittsburgh.
- B. G. B. Manufacturing Co., Dearborn, Mich.

Bowlby Air Devices Co., Wichita, Kan.
- Bryant Heater Co., Cleveland.

Budco, Inc., Detroit.
Burdett Mfg. Co., Chicago.
Calesco Corporation, Lynn, Mass.
Ceramic Products Mfg. Co., Milwaukee.
- Certified Furnace Company, St. Paul.
- Columbia Burner Co., Toledo.

Consolidated Industries, Inc., Lafayette, Ind.
Dalzen Tool & Manufacturing Co., Detroit.
Dearborn Stove Co., Dallas, Tex.
Denver Fire Clay Co., Denver, Colo.
Detroit Universal Products, Detroit.
Dornback Furnace & Foundry Co., Cleveland.
Dunn-Rite Products, Dearborn, Mich.
Economo Gas Products Co., Detroit.
El Van Ayre Corp., Cleveland.
Even-Air Mfg. & Sales Co., Detroit.
F & E Manufacturing Co., Centerville, Calif.
Famous Furnace Co., Cleveland.
Fieser Co., F. J., New York City.
- Finn Engineers, Inc., Jerry, St. Paul.

Firewel Company, Buffalo.
Gas Equipment Manufacturing Co., Cleveland.
Geisel Manufacturing, Inc., Elyria, Ohio.
Glasby Manufacturing Co., Inc., J. P. Bloomfield, N. J.
Goodfriend Plb. & Htg. Burner Sales, Detroit.
Gregory Co., J. G., Chicago.
Handley Brown Heater Co., Jackson, Mich.
Hansen Electric Co., San Francisco.
- Hayward Mfg. Co., C. A., Algonac, Mich.

Hel-Mor Burner Corporation, Detroit.
Hook & Miller, Etna, Pittsburgh.
Horsman-Markin Corp., Detroit.
H-P Products, Akron, O.
Hutchinson Burner & Mfg. Co., Hutchinson, Kan.
Inferno Co., Shreveport, La.
- Jackson Gas Burner Corp., Detroit.

Jackson Heating Co., Jackson, Mich.
Johnson Co., S. T., Oakland, Calif.
- Johnson Gas Appliance Co., Cedar Rapids, Iowa.

Kais Sunrise Works, Detroit.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Killam Gas Burner Co., Denver, Colo. (Nat'l, Mfr'd, Butane)
Kleenair Furnace Co., Portland, Ore.
Martin, J. O. & C. U., San Francisco.
Mid-Continent Metal Products Co., Chicago.
Modern Controls Corporation, Detroit.
Monad Products Co., Detroit.
Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
Moore Equipment Company, Lincoln, Nebr.
Mueller Furnace Co., L. J., Milwaukee.
Multi-Therm Mfg. Co., Inc., Detroit.
National Burner & Mfg. Co., Detroit.
National Engineering & Mfg. Co., Kansas City, Mo.
National Gas Burner Div., Mid-Continent Metal Products Co., Chicago.
National Stoker Co., St. Louis.
Norman Products Company, Columbus, O.
Olmstead & Co., Chas. M., Detroit.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pyro-Jet Div., Riverside Steel Co., Wheeling, W. Va.
Ransome Co., Emeryville, Calif.
- Reinhard Brothers Co., Inc., Minneapolis.

Roberts-Gordon Appliance Corp., Buffalo.
S and S Heating Co., Detroit.
- Schwab Safe Company, Lafayette, Ind.

Security Manufacturing Co., Kansas City, Mo.
Shaw Burner Company, Inc., Arkansas City, Kan.
- Silver Flame, Inc., Detroit.

Sonner Burner Co., Winfield, Kan.
Standard Fuel Engineering Co., Detroit.
Standard Heating & Radiator Co., Pittsburgh.
Sun-Fire Stoker Corporation, New Albany, Ind.
Supreme Gas Burner Mfg. Co., Detroit.
Surface Combustion, Toledo, O.
Taylor Appliance & Mfg. Co., Royal Oak, Mich.
Temtrol Mfg. Co., Detroit.
Vacuum Gas Burner Corp., Olean, N. Y.
Van's Gas Burner Service, Detroit.
Van Tuyl & Associates, J. E., Cleveland.
- Waterman-Waterbury Co., Minneapolis.

Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Webster Engineering Co., Tulsa. Okla.
Williams, Inc., F. C., Detroit.
Willoughby Machine & Tool Co., Willoughby, O.
Zephyr Gas Burner Company, Ferndale, Mich.
- Zink Co., John, Tulsa, Okla.

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BURNERS, OIL CONVERSION, RESIDENTIAL

Acme Oil Burner Company, Inc., Cedar Rapids, Ia. (Gun).
• Airtemp Division, Chrysler Corp., Dayton, O.
Aldrich Co., Wyoming, Ill.
• American Radiator & Standard Sanitary Corp., Pittsburgh. (Gun).
Arcweld Mfg. Co., Inc., Seattle, Wash.
Auburn Burner Co., Auburn, Ind. (Gun)
Auto-Heat Corp., New York City (Gun).
Automatic Burner Corp., Chicago (Gun).
Avery Farm Machinery Co., Hart Oil Burner Dept., Peoria, Ill. (Gun).
Badger Mfg. Co., Madison, Wis. (Gun).
Bard Manufacturing Company, Bryan, Ohio.
Beckett Engineering Co., R. W., Elyria, Ohio (Gun).
Bethlehem Foundry & Machine Co., Bethlehem, Pa., (Gun).
Bovee Furnace Works, Waterloo, Ia. (Gun).
Bryan Steam Corp., Peru, Ind. (Rotary and gun).
Calesco Corporation, Lynn, Mass.
Caloroil Burner Corp., Hartford, Conn. (Atmospheric, gun, horizontal rotary, vacuum pressure, wall flame).
Cary Mfg. Co., Waupaca, Wis. (Gravity).
• Century Engineering Corp., Cedar Rapids, Ia. (Gun).
Chalmers Oil Burner Co., Minneapolis (Gun and rotary).
Chandler Company, Cedar Rapids, Iowa (Gun and gravity).
Chicago Steel Furnace Co., Chicago.
• Cleveland Steel Products Corporation, Toridheet Div., Cleveland.
• Conco Engineering Works, Mendota, Ill. (Gun).
Cooper & Cooper, Inc., Pittsfield, Mass.
Consolidated Industries, Inc., Lafayette, Ind. (Gun).
Crane Company, Chicago (Gun).
Delco Appliance Div., General Motors Corp., Rochester, N. Y. (Gun).
Eckhart Manufacturing Company, Roselle, N. J.
D'Elia Oil Burner Co., Inc., Bridgeport, Conn. (Gun).
• Dowagiac Steel Furnace Co., Dowagiac, Mich. (Gun).
Eastern Oil & Equipment Co., Portland, Me. (Gun).
Electric Furnace-Man, Inc., Emmaus, Pa.
Electrol Mfg Co., Rutherford, N. J. (Gun).
Florence Stove Co., Gardner, Mass. (Gravity).
• Fluid Heat Division, Anchor Post Products, Inc., Baltimore (Gun, rotary).
• Forest City Foundries Co., Cleveland (Gun).
Freeport Burner & Fan Co., Freeport, Ill. (Gun).
General Electric Co., Bloomfield, N. J. (Gun).
General Oil Heating Corp., West New York, N. J. (Gun).
Gilbert & Barker Mfg. Co., West Springfield, Mass. (Gun).
Gilmore & Co., Jackson G., Columbus, O. (Vaporizing)
Green Colonial Furnace Company, Des Moines, Iowa (Gun).
• Hall-Neal Furnace Co., Indianapolis (Gun).
• Harvey-Whipple, Inc., Springfield, Mass. (Gun).
• Heat Oil Inc., Detroit (Gun).
Heat-Seal Burner Co., Omaha, Nebr. (Gun).
• Heil Co., Milwaukee (Gun).
Herco Oil Burner Corp., Lancaster, Pa. (Gun).
• Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater, Mich. (Gun).
Hotentot Co., Inc., Omaha, Nebr. (Gun).
Iron Fireman Mfg. Co., Cleveland (Gun and luminous vortex).
• Jackson & Church Co., Saginaw, Mich.
• Jennings, Freeland L., Lima, O. (With integral domestic water heating unit).
Johnson Co., S. T., Oakland, Calif. and Philadelphia (Gun).
Kais Sunrise Works, Detroit (Gravity).
Kalamazoo Stove & Furnace Company, Kalamazoo, Mich.
Keith Furnace Co., Des Moines, Ia. (Gun).
Kleen Heet, Inc., Chicago (Gun).
• Kresky Mfg. Co., Petaluma, Calif. (Gravity).
Laco Oil Burner Co., Griswold, Ia. (Gun and Gravity).
Lennox Furnace Co., Marshalltown, Iowa (Gun—Pressure Atomizer).
Little Burner Co., Inc., H. C. San Rafael, Calif. (Gravity).
• Majestic Co., Huntington, Ind. (Gun).
Malleable Iron Fittings Co., Branford, Conn. (Gun).
McPherson Furnace & Supply Co., Portland, Ore. (Gun).
Marine Mfg. Co., Chicago (Gun).
Mason Machine Co., York, Pa. (Continuous variable flame).
May Oil Burner Div., Gerotor May Corp., Baltimore (Gun).
• Meyer Furnace Co., Peoria, Ill. (Gun).
Montag Stove & Furnace Works, Portland, Ore. (Gun).
Moore Equipment Company, Lincoln, Nebr. (Gun).
Mt. Hawley Mfg. Co., Peoria, Ill. (Gun).
• Mueller Furnace Co., L. J. Milwaukee, Wis. (Gun, gravity).
National Airoil Burner Co., Philadelphia (Gun).
• Norge Heat Division, Borg-Warner Corp., Detroit (Gun).
Nu-Way Corp., Rock Island, Ill. (Gun).
Oil Devices, Chicago (Pot Type).
Pan-American Engineering Company, Berkeley, Calif. (Gun rotary and turbine).
Paragon Oil Burner Corp., Brooklyn (Gun).
Peerless Oil Burner Co., Inc., Kansas City, Mo. (Gravity).
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (Gun).
• Petroleum Heat & Power Co., Stamford, Conn. (Gun).
Preferred Utilities Manufacturing Corp., New York City.
Quaker Mfg. Co., Chicago (Vaporizing Bowl).
Quick Furnace & Supply Co., Des Moines, Ia.
Quiet-Heet Mfg. Corp., Newark, N. J. (Gun).
Quincy Stove Mfg. Co., Quincy, Ill. (Gravity)
Ray Oil Burner Co., San Francisco (Gun and rotary).
• Round Oak Co., Dowagiac, Mich. (Gun).
• Rudy Furnace Co., Dowagiac, Mich. (Gun).
• Rybolt Heater Company, Ashland, Ohio (Gun).
Sandberg Co., H. J., Portland, Ore.
• Schwab Safe Company, Lafayette, Ind. (Gun).
Scott-Newcomb, Inc., St. Louis (Gun).
Shedlov Oil Burners, Inc., Minneapolis (Gun).
Silent Glow Oil Burner Corp., Hartford, Conn, (Gun and rotary).
Simplex Oil Heating Corp., New York (Gun, rotary, turbine).
Sundstrand Engineering Co., Rockford, Ill. (Gun).
Sun-Fire Stoker Corporation, New Albany, Ind. (Gun).
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit (Gun and rotary).
Victor Oil Burner Mfg. Co., Hartford, Conn. (Gravity).
Viking Manufacturing Co., Cleveland (Gun).
Volcano Burner Corp., New York City (Gun).
• Waterman-Waterbury Co., Minneapolis (Gun).
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Weatherall Engineers, Inc., Providence, R. I. (Gun).
Westwick & Son, Inc., John, Galena, Ill. (Gun).
• Williams Oil-O-Matic, Div. Eureka Williams Corporation, Bloomington, Ill. (Gun).
Wood Industries, Inc., Gar, Wayne, Mich. (Gun).
York Electric and Machine Company, York, Pa.
York-Heat Div., York-Shipley, Inc., York, Pa. (Gun).

BURRING MACHINES

See Machines, Burring

CABINETS AND CASINGS

Acme Tin Plate & Roofing Supply Co., Philadelphia.
Airwasher Corporation, Eaton Rapids, Mich.
Armstrong Furnace Company, Columbus, Ohio.
Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
Biersach & Neidermeyer Company, Milwaukee.
• Brundage Co., Kalamazoo, Mich.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Edwards Manufacturing Co., Cincinnati.
Falstrom Co., Passaic, N. J.
Kirk & Blum Mfg. Co., Cincinnati, O.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
Lindsay Corporation, Melrose Park, Ill.
Maysteel Products, Inc., Milwaukee.
Mitchell Air Conditioning Co., Inc., Schenectady, N. Y.
Moss Industries, Inc., Brooklyn, N. Y.
Northwest Foundry & Furnace Co., Inc., Portland, Ore.
Riester & Thesmacher Co., Cleveland.
St. Charles Mfg. Co., St. Charles, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Utica Products, Incorporated, Utica, N. Y.

CAPS AND TOPS, CHIMNEY

• Acculate Mfg. Works, Chicago (Revolving).
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Adams Company, The, Dubuque, Iowa.
Ames Co., W. R., San Francisco.
Bieler & Son, L., Long Island City (Shanty and revolving).
Breidert Co., G. C., Los Angeles.
Edwards Mfg. Co., Inc., Cincinnati.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
• Gelert Company, C. E., Pasadena, Cal.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Iwan Brothers, South Bend, Ind.
Lamb & Ritchie Co., Cambridge, Mass.
Little Burner Co., Inc., H. C., San Rafael, Calif.
Los Angeles Sheet Metal Mfg. Co., Inc., Los Angeles.
Penn Supply & Metal Corporation, Philadelphia.
Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Sterling Foundry Company, Sterling, Ill. (Cast Iron).
Tierney Rotor Ventilator Co., Minneapolis.
• Williams-Wallace Co., San Francisco.

CASINGS

See Cabinets and Casings

CAULKING COMPOUNDS

See Compounds, Caulking

CEILINGS, METAL

• Ajax Furnace Fitting Div., Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Canton Steel Ceiling Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Friedley-Voshardt Co., Chicago.
Hauserman Co., E. F., Cleveland.

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International Steel Company, Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
Reynolds Metals Company, Louisville, Ky. (Aluminum).
Sioux Steel Co., Sioux Falls, S. D.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Art Metal Co., Tiffin, O.
Wheeling Corrugating Co., Wheeling, W. Va.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago.
• Armstrong Co., Detroit.
Botfield Refractories Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio.
Chicago Fire Brick Company, Chicago.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
• Fireline Stove & Furnace Lining Co., Chicago. (Asbestos).
Glidden Company, Cleveland.
Green Fire Brick Co., A. P., Mexico, Mo.
Hercules Chemical Co., Inc., New York City.
Hetzel Roofing Products Co., Newark, N. J.
Johns-Manville, New York City.
Keasbey Co., Robert A., New York City (Asbestos).
Laclede-Christy Clay Products Co., St. Louis.
Lastik Products Co., Inc., Pittsburgh.
McLeod & Henry Co., Inc., Troy, N. Y.
Munn and Steele, Inc., Newark, N. J.
Nebel Manufacturing Co., Cleveland.
Pecora Paint Co., Philadelphia (Asbestos).
Plastic Products Co., Detroit.
Preferred Utilities Mfg. Corp., New York City.
Presstite Engineering Co., St. Louis.
Quigley Company, Inc., New York City.
Refractory & Insulation Corp., New York City.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
• Sall Mountain Co., Chicago.
Sauereisen Cements Co., Sharpsburg, Pa.
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit.
Tamms Silica Company, Chicago (Asbestos).
U. S. Stoneware Company, Akron, Ohio, and New York City.
Walsh Refractories Corp., St. Louis.
Wilhelm Co., A., Reading, Pa.
• Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago (Asbestos, mineral wool and magnesia).
Alton Mineral Wool Insulation Co., St. Louis.
Baldwin-Hill Co., Trenton, N. J. (Rockwool).
Bird Archer Co., Philadelphia.
Botfield Refractories Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio (Asbestos, Mag. Rockwool).
Chicago Fire Brick Co., Chicago (Asbestos).
Eagle-Picher Co., Cincinnati (Asbestos).
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Asbestos).
Green Fire Brick Company, A. P., Mexico, Mo. (Vermiculite).
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York City (Asbestos).
Keasbey Co., Robert A., New York City (Asbestos).
Keasby & Mattison Co., Ambler, Pa. (Asbestos).
McLeod & Henry Co., Inc., Troy, N. Y.
Munn and Steele, Inc., Newark, N. J. (Vermiculite).
National Gypsum Co., Buffalo (Rock Wool).
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ohmlac Paint & Refining Co., Chicago (Asphalt, Asbestos)
• Owens-Corning Fiberglas Corp., Toledo, O. (Mineral wool).
Peterson Co., B. A., Dowagiac, Mich. (Asbestos).
Plant Rubber & Asbestos Works, Inc., San Francisco (Asbestos).
Plibrico Jointless Firebrick Co., Chicago. (Mineral wool).
Preferred Utilities Mfg. Corp., New York City.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City (Asbestos)
Ramtite Co., Div. of S. Obermayer Co., Chicago.
Refractory & Insulation Corp., New York City (Wool).
• Rex-Roto Corporation, Detroit.
Robinson Insulation Co., Great Falls, Mont. (Vermiculite).
Ruberoid Co., New York City (Asbestos).
Rutland Fire Clay Co., Rutland, Vt. (Asbestos).
• Sall Mountain Co., Chicago.
Sauereisen Cements Co., Pittsburgh.
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit (Rock wool and asbestos).
Tennessee Products Corp., Nashville, Tenn. (Mineral Wool).
Therminsul Corp., Kalamazoo, Mich.
Thompson & Co., Oakmont (Pittsburgh Dist.) Pa.
United States Mineral Wool Co., Chicago (High temperature mineral wool).
Universal Zonolite Insulation Co., Chicago (Vermiculite).
Westinghouse Electric Corporation, East Pittsburgh, Pa.
• Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, REFRACTORY

See Refractories

CEMENT, ROOF

Acme Asbestos Covering & Flooring Co., Chicago.
American-Marietta Company, Chicago.
• Armstrong Co., Detroit.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Bird & Son, Inc., East Walpole, Mass.
Blue Ridge Talc Co., Inc., Henry, Va.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio.
Carter Paint Co., Liberty, Ind.
Celotex Corp., Chicago.
Certain-teed Products Corp., New York City.
Clinton Metallic Paint Co., Clinton, N. Y.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., Inc., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt).
Johns-Manville, New York City.
Koppers Company, Inc., Pittsburgh.
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Midland Paint & Varnish Co., Cleveland (Fiberseal).
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago.
Pecora Paint Co., Philadelphia (Asbestos).
Presstite Engineering Co., St. Louis.
• Prole & Coogan Heating Co., Pittsburgh.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Smooth-On Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
United States Gypsum Co., Chicago.
Wilhelm Co., A., Reading, Pa.

CHAIN, FURNACE

American Chain Div., American Chain & Cable Co., Inc. York, Pa.
Bead Chain Mfg. Co., Bridgeport, Conn.
Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hodell Chain Co., Cleveland.
McKay Co., York, Pa.
Russell Mfg. Co., John M., Naugatuck, Conn.
Turner & Seymour Mfg. Co., Torrington, Conn.
• United States Register Co., Battle Creek, Mich.

CHAMBERS, COMBUSTION, PREFORMED

Chicago Fire Brick Company, Chicago (Castable).
Commonwealth Products Co., Philadelphia.
Green Fire Brick Company, A. P., Mexico, Mo.
Harvey, Inc., Sid, Valley Stream, N. Y.
• Hasco Utilities Company, New York City (Refractory)
McLeod & Henry Co., Inc., Troy, N. Y.
Monogram Combustion Chamber Co., Philadelphia.
Munn and Steele, Inc., Newark, N. J. (Light fired refractory).
National Airoil Burner Company, Inc., Philadelphia (Fire clay—burned).
Peterson Co., B. A., Dowagiac, Mich.
Petroleum Equipment Mfg. Co., New Haven, Conn. (Stainless).
Preferred Utilities Manufacturing Corp., New York City.
• Rex-Roto Corporation, Detroit.
Rehm, R., St. Albans, L. I., N. Y. (Radiant Silicons).
Robinson Insulation Co., Great Falls, Mont.
Universal Zonolite Insulation Co., Chicago (Vermiculite concrete).
Webber Co., A .R., New Haven, Conn.

CHANNELS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

CHEMICALS, RUST PREVENTIVE, FOR PRETREATING METALS

American Chemical Paint Co., Ambler, Pa.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Industrial Service Laboratories, Milwaukee
Neilson Chemical Co., Detroit.
North American Fibre Products Co., Cleveland.
Oakite Products, Inc., New York City.
Parker Rust-Proof Co., Detroit.
Pennsylvania Salt Mfg. Co., Philadelphia.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

Protective Coatings, Inc., Detroit.
Standard Steel Spring Co., Gary, Ind.
Truscon Laboratories, Detroit.
Turco Products, Inc., Los Angeles.
Western Reserve Laboratories, Cleveland.
Wolfe-Kote Co., Sheboygan, Wis.

CHIMNEY CAPS

See Caps and Tops, Chimney

CHIMNEY LININGS

See Linings, Chimney

CLEANERS, POLISHERS AND FINISHERS, METAL

(Liquid, Paste and Powder)

• Allen Co., L. B., Inc., Chicago (Stainless).
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
NuSteel Company, Chicago.
Oakite Products, Inc., New York City.
Pennsylvania Salt Mfg. Co., Philadelphia.
Tamms Silica Company, Chicago.
Turco Products, Inc., Los Angeles.
Wolfe-Kote Co., Sheboygan, Wis. (Liquid).

CLEANERS, VACUUM, FURNACE

Baker Furnace & Cleaner Mfg. Co., Toledo, O.
• Black & Decker Mfg. Co., Towson, Md.
• Breuer Electric Mfg. Co., Chicago.
Brophy, Inc., J. D., New York City.
• Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Ideal Industries, Inc., Sycamore, Ill.
Kent Co., Inc., Rome, N. Y.
• National Super Service Co., Toledo, O.
Spencer Turbine Co., Hartford, Conn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.

CLEAT BENDERS

See Machines, Cleat Bending

CLEATS, DRIVE

See Connectors, Metal, for Metal Ducts

CLIPS, FASTENING, FOR ROOFING

Bard Manufacturing Co., Bryan, O.
• Berger Brothers Co., Philadelphia.
Bridesburg Foundry Co., Philadelphia.
Cinch Manufacturing Corp., Detroit.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Edwards Mfg. Co., Inc., Cincinnati.
• Milcor Steel Co., Milwaukee.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Wiley Manufacturing Co., Detroit.

CLIPS AND TIPS, DAMPER

• Adams Company, The, Dubuque, Iowa.
• Air Control Products, Inc., Coopersville, Mich.
• Berger Bros. Co., Philadelphia.
• Gerett Co., M. A., Milwaukee.
• Goese Mfg. Co., Milwaukee.
Griswold Mfg. Co., Erie, Pa.
• Hart & Cooley Mfg. Co., Holland, Mich.
Howes-Woods Company, Cambridge, Mass.
Kerentoff, G. L., Cincinnati.
• Mueller Furnace Co., L. J. Milwaukee.
Schoedinger, F. O., Columbus, Ohio.
• United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland.

CO_2 ANALYZERS

See Analyzers, CO_2

COAL BURNERS, AUTOMATIC

See Stokers

COILS, COOLING, DIRECT EXPANSION, FINNED

Acme Industries, Inc., Jackson, Mich.
• Aerofin Corp., Syracuse, N. Y.
• Airtemp Division, Chrysler Corp., Dayton, O.
American Blower Corporation, Detroit.
American Coils, Inc., Newark, N. J.
Baltimore Aircoil Co., Baltimore.
Beacon-Morris Corp., Boston, Mass.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Co., Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, Ohio.
G & O Mfg. Co., New Haven, Conn.
General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Griscom-Russell Co., The, New York City.
Ice Air Conditioning Co., Inc., Brooklyn.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Marlo Coil Co., St. Louis.
Mitchell & Co., Inc., W. K., Philadelphia.
Murray Mfg. Co., D. J., Wausau, Wis.
Peerless of America, Inc., Chicago.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Sturtevant Co., B. F., Div., Westinghouse Electric, Hyde Park, Mass.
Tenney Engineering Co., Newark, N. J.
Trane Co., La Crosse, Wis.
• United States Air Conditioning Corp., Minneapolis.
Vilter Mfg. Co., Milwaukee.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COILS, COOLING, WATER

Acme Industries, Inc., Jackson, Mich.
• Aerofin Corp., Syracuse, N. Y.
• Airtemp Division, Chrysler Corp., Dayton, O.
Beacon-Morris Corp., Boston.
Bell & Gossett Co., Morton Grove, Ill.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Fan & Fin Coil Co., Chicago.
Conditionaire Unit Company, Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
Frigidaire Division, General Motors Corporation, Dayton, O.
G & O Mfg. Co., New Haven, Conn.
General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Griscom-Russell Co., The, New York City.
Ice Air Conditioning Co., Inc., Brooklyn.
Industrial Mfg. & Eng. Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Marlo Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National Pipe Bending Co., New Haven, Conn.
Nesbitt, Inc., John J., Philadelphia.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Peerless of America, Inc., Chicago.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Sturtevant Co., B. F., Div., Westinghouse Electric, Hyde Park, Mass.
Super Radiator Corp., Minneapolis.
Trane Co., La Crosse, Wis.
• United States Air Conditioning Corporation, Minneapolis.
Vilter Mfg. Co., Milwaukee.
Whitlock Manufacturing Co., Hartford, Conn.
Wing Manufacturing Co., L. J., New York City.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

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COILS, FIRE POT, HOT WATER

- Adams Company, The, Dubuque, Iowa.
- Air Controls, Inc., Cleveland.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

Globe Machinery & Supply Co., Des Moines, Ia.

- Harvey-Whipple, Inc., Springfield, Mass.

Hotstream Heater Co., Cleveland.
Lennox Furnace Co., Marshalltown. Ia.
Marshall Furnace Co., Marshall, Mich.

- Mueller Furnace Co., L. J. Milwaukee.

Murray Mfg. Co., D. J. Wausau, Wis.
Rempe Co., Chicago.

COILS, HEATING

- Aerofin Corp., Syracuse, N. Y.

American Blower Corporation, Detroit.

- Bayley Blower Co., Milwaukee.

Beacon-Morris Corporation, Boston.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City, Mo.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Fan & Fin Coil Co., Chicago.
Conditionaire Unit Company, Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
G & O Mfg. Co., New Haven, Conn.
General Electric Co., Bloomfield, N. J.
Griscom-Russell Co., New York City.
Ice Air Conditioning Co., Inc., Brooklyn.
Industrial Mfg. & Eng. Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Marlo Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia.
New York Blower Co., Chicago.
Peerless of America, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, Ohio.
Rempe Co., Chicago.
Roessing Manufacturing Co., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Heater and Oil Equipment Co., Jersey City.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Super Radiator Corp., Minneapolis.
Trane Co., La Crosse, Wis.

- United States Air Conditioning Corporation, Minneapolis.

Vulcan Radiator Co., Hartford, Conn.
Whitlock Mfg. Co., Hartford, Conn.
Wing Mfg. Co., L. J., New York City.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COLLECTORS, BLOW PIPE

Aerotec Company, White Plains, N. Y.
Aget-Detroit Co., Ann Arbor, Mich.
Allen Billmyre Div. Lamson Corp., Mamaroneck, N. Y.
American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., Detroit.

- American Metal Products Co., Fort Worth, Texas.
- Bayley Blower Co., Milwaukee.

Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Centri-Spray Co., Detroit.
Day Co., Minneapolis.
Dust Suppression & Engineering Co., Lake Orion, Mich.

- Georgen-Mackwirth Co., Inc., Buffalo. (Rarefied and Cyclone).

Goethel Sheet Metal Works, Alfred, Milwaukee.
Ideal Industries, Inc., Sycamore, Ill.
Kirk & Blum Mfg. Co., Cincinnati.
Knickerbocker Co., Jackson, Mich.
Kopperman & Sons, Joseph, Philadelphia.
Lumm Co., A. H., Toledo, Ohio.
Newcomb Engineering Co., Grand Rapids, Mich.
Northern Blower Co., Cleveland.
Pangborn Corp., Hagerstown, Md.
Peters-Dalton, Inc., Detroit.
Prat-Daniel Corp., East Port Chester, Conn.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Ruemelin Mfg. Co., Milwaukee.
Schmieg Industries, Detroit.
Schneible Co., Claude B., Detroit.
Skinner Heating & Vent Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Sly Mfg. Co., W. W., Cleveland.
Stranwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Torit Manufacturing Co., St. Paul, Minn.
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles.
Winkler & Sons, Inc. A. E., Milwaukee.
Young & Bertke Co., Cincinnati.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMPOUNDS, AIR FRESHENING

Ampion Corporation, Long Island City, N. Y.
Betz Corporation, Hammond, Ind.
Lundy, Inc., E. A., New York City.
Wheeler, Inc., W. H., New York City.

COMPOUNDS, CAULKING

Acme Refining Co., Cleveland.
Alden Mfg. Co., Painesville, Ohio.
Allmetal Weatherstrip Co., Chicago.
American-Marietta Company, Chicago.

- Armstrong Co., Detroit.

Babbitt Chemical Specialties Co., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio.
Carter Paint Co., Liberty, Ind.
Chamberlin Company of America, Detroit.
Cheesman-Elliot Company, Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Eagle-Picher Co., Cincinnati, O.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Company, Cleveland.
Goodrich Co., B. F., Akron, O.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., Inc., A. C., Long Island City, N. Y.
Iowa Paint Mfg Co., Des Moines, Ia.
Irvington Varnish & Insulator Co., Irvington, N. J.
Johns-Manville, New York City.
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Maas and Waldstein Co., Newark, N. J.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
Mortell Co., J. W., Kankakee, Ill.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmiac Paint & Refining Co., Chicago (Asphalt).
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Plastic Products Co., Detroit.
Presstite Engineering Co., St. Louis.
Quigley Company, Inc., New York City.
Radiator Specialty Co., Charlotte, N. C.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh, Pa.
Sherwin-Williams Co., Cleveland.
Sipe & Company, James B., Pittsburgh.
Smooth-on Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Company, Savannah, Ga.
Tamms Silica Company, Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Wilhelm Co., A., Reading, Pa.
X-Pando Corp., Long Island City, N. Y.
Yardley Venetian Blind Co., Columbus, Ohio.

COMPOUNDS, CLEANING, AIR FILTER

Carolina Aniline & Extract Co., Inc., Charlotte, N. C. (Humidifying systems).
Oakite Products, Inc., New York City.
Turco Products, Inc., Los Angeles.

COMPRESSORS, REFRIGERATING

- Airtemp Division, Chrysler Corp. Dayton, O.

Baker Ice Machine Co., Inc., Omaha, Nebr.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Copeland Refrigeration Corp., Sidney, Ohio.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Diceler Corp., Gasport, N. Y.
Frick Co., Waynesboro, Pa.
Frigidaire Division, General Motors Corporation, Dayton, O.
General Electric Co., Bloomfield, N. J.
General Machinery Co., Spokane, Wash, (Ammonia).
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Howe Ice Machine Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.

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Lehigh Industries, Inc., Lancaster, Pa.
Lynch Manufacturing Corporation, Toledo, O.
Mills Novelty Co., Chicago.
Reynolds Manufacturing Co., Springfield, Mo.
Servel, Inc. Evansville, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Tecumseh Products Co., Tecumseh, Mich.
Trane Co., La Crosse, Wis.
Universal Cooler Div., Marion, Ohio.
Vilter Mfg. Co., Milwaukee.
Wittenmeier Machinery Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.
Yeomans Brothers Co., Chicago.
York Corp., York, Pa.

CONDUCTOR PIPE

See Pipe, Conductor

CONNECTIONS, DUCT, FLEXIBLE

(Asbestos, Canvas, etc.)

American Ventilating Hose Co., New York City.
Chicago Metal Hose Corp., Maywood, Ill.
Felters Co., The, Boston.
United States Rubber Co., New York City.
Warner Bros. Co., Bridgeport, Conn.
• Wilson, Inc., Grant, Chicago (Asbestos).
Wiremold Co., Hartford, Conn.

CONNECTORS, METAL, FOR METAL DUCTS

(Drive Cleat)

• Char-Gale Mfg. Co., Minneapolis.
Corbman Bros., Inc., Philadelphia.
• International Heater Co., Utica, N. Y.
• Milcor Steel Company, Milwaukee.
• Waterman-Waterbury Co., Minneapolis.

CONTROLS, CONTROL SYSTEMS

Blower, Speed Changing

National Thermal Drive Co., St. Paul. (Thermal)
Webster Electric Co., Racine, Wis. (Thermal)
• White Manufacturing Co., St. Paul (Thermal).

Combined Fan and Limit, Line and Low Voltage

Cook Electric Co., Chicago.
Defender Instrument and Regulator Co., St. Louis.
• Detroit Lubricator Co., Detroit.
• General Controls Co., Glendale, Cal.
Master Electric Company, Dayton, Ohio.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• Standard Remote Control Valve Company, South Pasadena, Cal.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

Combustion, Bonnet or Smoke Pipe, Line and Low Voltage

Barber-Colman Co., Rockford, Ill.
Crown Controls Co., New Bremen, Ohio.
• General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind. (Low).
• Perfex Corporation, Milwaukee.
Photoswitch, Inc., Cambridge, Mass. (Electric eye) (Low).
• Sampsel Time Control, Inc., Spring Valley, Ill.

Draft, Barometric

(See also Hoods, Draft, Gas)
Atlas Utilities Co., Inc., Providence, R. I. (Thermostatic).
Atlas Valve Co., Newark, N. J.
Barber-Colman Company, Rockford, Ill.
Campbell Engineering Co., Appleton, Wis.
• Cole-Sewell Engineering Co., St. Paul.
Empire Ventilation Equipment Co., Long Island City, N. Y.
• Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Herd Utilities, Inc., Providence, R. I. (Thermostatic).
Hotstream Heater Co., Cleveland (Automatic).
James Regulator Co., Inc., Pottsville, Pa.
Mason-Neilan Regulator Co., Boston.
• Perfex Corporation, Milwaukee.
Preferred Utilities Mfg. Corp., New York City.
Simplex Manufacturing Co., Fond du Lac, Wis.
• Walker Mfg. & Sales Corp., St. Joseph, Mo.

Effective Temperature

Barber-Colman Co., Rockford, Ill.
Crown Controls Co., New Bremen, Ohio.
Friez Instrument Division, Towson, Md.
Fulton Sylphon Co., Knoxville, Tenn.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis
Tagliabue Div., C. J., Brooklyn.

Fan, Line and Low Voltage

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Barber-Colman Co., Rockford, Ill.
• Cam-Stat, Incorporated, Los Angeles.
Clark Controller Co., Cleveland.
• Detroit Lubricator Co., Detroit.
• Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
Master Electric Company, Dayton, Ohio.
McCorkle Co., D. H., Berkeley, Calif. (Low).
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn. (Low).
• White-Rodgers Electric Co., St. Louis.

Heating, Ventilating and Air Conditioning Systems, Pneumatic

Atlas Valve Co., Newark, N. J.
Bristol Co., Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Co., Knoxville, Tenn.
Johnson Service Co., Milwaukee.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn
• Mineapolis-Honeywell Regulator Co., Minneapolis.
Powers Regulator Co., Chicago.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

Limit, Line and Low Voltage

Allen-Bradley Co., Milwaukee. (Low).
Arrow-Hart & Hegeman Electric Co., Hartford, Conn. (Low).
Au-Temp-Co Corporation, New York City.
• Cam-Stat, Incorporated, Los Angeles.
Crown Controls Co., New Bremen, Ohio (Low).
• Detroit Lubricator Co., Detroit.
General Electric Co., Schenectady, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
Master Electric Company, Dayton, Ohio.
McCorkle Co., D. H., Berkeley, Calif. (Low).
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Mueller Furnace Co., L. J., Milwaukee (Low).
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

Oil Burner, Complete Assembly

• Automatic Products Co., Milwaukee.
Defender Instrument and Regulator Co., St. Louis.
• General Controls Co., Glendale, Cal.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Wheelco Instruments Co., Chicago.

Stoker, Complete Assembly

Defender Instrument and Regulator Co., St. Louis.
• Detroit Lubricator Co., Detroit.
• Gleason-Avery, Inc., Auburn, N. Y.
Hays Corporation, Michigan City, Ind.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago, Ill.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Palmer Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White-Rodgers Electric Co., St. Louis.

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Window Condensation

See also Humidstats and Thermostats

Friez Instrument Div., Towson, Md.

CONTROL SYSTEMS

Forced Air Furnace, Hand-Fired (Package)

(Bonnet Control of Blower)

Barber-Colman Co., Rockford, Ill.
Crown Controls Co., New Bremen, Ohio.
• Gleason-Avery, Inc., Auburn, N. Y.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

Forced Air Furnace, Hand-Fired (Package)

(Thermostat Control of Blower)

Barber-Colman Co., Rockford, Ill.
• General Controls Co., Glendale, Calif.
• Gleason-Avery, Inc., Auburn, N. Y.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

Gravity Furnace, Hand-Fired (Package)

• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.
Crise Electric Mfg. Co., Columbus, Ohio.
Crown Controls Co., New Bremen, Ohio.
Defender Instrument and Regulator Co., St. Louis.
• General Controls Co., Glendale, Calif.
• Gleason-Avery, Inc., Auburn, N. Y.
Master Electric Company, Dayton, Ohio.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

Zone Distribution, Complete

Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
• General Controls Co., Glendale, Cal.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Sampsel Time Control, Inc., Spring Valley, Ill.

COOLING SURFACE

See Coils, Cooling, Water

COPPERS, SOLDERING

• American Brass Co., Waterbury, Conn.
Bernz Co., Otto, Rochester, N. Y.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Dual-Heat Iron Co., Los Angeles (Electric).
Dual Remote Control Co., Wayne, Mich.
Electric Soldering Iron Co., Inc., Deep River, Conn. (Electric)
Everhot Mfg. Co., Maywood, Ill.
General Electric Co., Schenectady, N. Y. (Electric).
Hexacon Electric Co., Roselle Park, N. J. (Electric)
• Hussey & Co., C. G., Pittsburgh.
Ideal Industries, Inc., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago (Air-Acetylene)
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
• Peck, Stow & Wilcox Co., Southington, Conn.
Ransome Company, Emeryville, Calif. (Gas)
• Reiner & Campbell Co., Inc., Elizabeth, N. J. (Carbide)
• Revere Copper & Brass, Incorporated, New York City.
Sheet Metal Mfg. Co., Brooklyn.
Sight Feed Generator Co., Richmond, Ind.
Sound Equipment Corp., Glendale, Cal. (Thermostatic-electric)
Stanley Tools, New Britain, Conn.
Sta-Warm Electric Co., Ravenna, O.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Vulcan Electric Co., Danvers, Mass. (Electric)
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Weiss & Co., H., New York City.

CRANES, OVERHEAD TRAVELING—HAND AND POWER

American Chain Div., American Chain & Cable Co., Inc., York, Pa.
American MonoRail Co., Cleveland.
Chicago Tramrail Co., Chicago.
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
Consolidated Steel Corp., Ltd., Los Angeles.
Euclid Crane & Hoist Co., Cleveland.
Harnischfeger Corporation, Milwaukee.
Judson Pacific Co., San Francisco.
Louden Co., Fairfield, Iowa.
Reading Chain & Block Corp., Reading, Pa.
Richards-Wilcox Manufacturing Co., Aurora, Ill.
Robbins & Myers, Inc., Springfield, Ohio
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.
Wright Manufacturing Division, American Chain & Cable Co., Bridgeport, Conn.

CRIMPING MACHINES

See Machines, Crimping

DAMPER MOTORS

See Motors, Damper, Furnace Draft, Electrical

DAMPER CONTROLS

See Regulators, Damper Sets

DAMPER REGULATOR SETS

See Regulators, Damper Sets

DAMPERS, FOR WARM AIR PIPES

• Adams Co., Dubuque, Ia.
Berger Furnace Mfg. Co., Pittsburgh.
• Hart & Cooley Mfg. Co., Holland, Mich.
Lennox Furnace Co., Marshalltown, Ia.
• May-Fiebeger Company, Newark, Ohio
• Milcor Steel Co., Milwaukee.
• Peerless Foundry Co., Inc., Indianapolis.
Sheet Metal Mfg. Co., Inc., Brooklyn.
• United States Register Co., Battle Creek, Mich.

DAMPERS, SMOKE PIPE

• Adams Co., Dubuque, Ia.
• Char-Gale Mfg. Co., Minneapolis.
Deegan Mfg. Co., E. J., New York City.
Eselgroth & Co., Newark, N. J.
• Forest City Foundries Co., Niagara Furnace Div., Cleveland. (Check Damper)
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Griswold Mfg. Co., Erie, Pa.
Hotstream Heater Co., Cleveland.
Howes-Woods Company, Cambridge, Mass.
James Regulator Co., Inc., Pottsville, Pa. (For water heaters).
Keith Furnace Co., Des Moines, Ia.
Maple City Furnace Co., Monmouth, Ill.
• Mueller Furnace Co., L. J., Milwaukee.
• Peerless Foundry Co., Inc., Indianapolis.
Preferred Utilities Manufacturing Corp., New York City.
Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
• United States Register Co., Battle Creek, Mich.
• Walker Mfg. & Sales Corp., St. Joseph, Mo.
• Williamson Heater Co., Cincinnati.

DAMPERS, STACK HEAD

Barber-Colman Co., Rockford, Ill.
• Henry Furnace Co., Medina, Ohio.
• Milcor Steel Company, Milwaukee.

DECKING, STEEL ROOF

• Airtherm Mfg. Co., St. Louis.
Goldsmith Metal Lath Co., Cincinnati, Ohio.
Wheeling Corrugating Company, Wheeling, W. Va.

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DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

Air and Refrigeration Corp., New York City.
• Bryant Heater Co., Cleveland. (Silica gel.)
Carbide and Carbon Chemicals Corp., New York City (Triethylene glycol).
Cargocaire Engineering Corp., New York City. (For ships).
Carrier Corp., Syracuse, N. Y.
Davison Chemical Corp., Baltimore, Md.
Floridin Co., Warren, Pa.
Kaufman Co., H. J., Detroit (Absorption).
Morf Industries, Inc., Staten Island, N. Y. (Adsorption).
Pittsburgh Lectrodryer Corp., Pittsburgh. (Adsorption).
Rogers Diesel & Air Craft Corp., New York.
Solvay Sales Corp., New York City.
Surface Combustion, Toledo, Ohio.
Tamms Silica Co., Chicago.
York Corporation, York, Pa.

DIES

See Presses and Dies

DIFFUSERS, CEILING, AIR, HIGH VELOCITY

• A-J Manufacturing Co., Kansas City, Mo.
• Air Devices, Inc., New York City.
• Anemostat Corporation of America, New York City.
Barber-Colman Co., Rockford, Ill.
Connor Eng. Corp., New York City (High Velocity).
Demuth & Sons, Charles, Mineola, L. I., N. Y.
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Register & Grille Manufacturing Company, Inc., Brooklyn.
• Tuttle & Bailey, Inc., New Britain, Conn.
Wilster, Inc., Cleveland.

DRAFT DIVERTERS FOR GAS HEATERS

Bastian-Morley Co., Inc., La Porte, Ind.
Berger Furnace Mfg. Co., Pittsburgh (Hoods).
Cramer Sheet Metal Co., Canton, O. (Hoods).
Famous Furnace Co., Cleveland (Hoods). Finger, Joe, Cleveland.
Hotstream Heater Co., Cleveland.
International Sales Co., San Francisco.
Los Angeles Sheet Metal Manufacturing Co., Inc., Los Angeles.
Maysteel Products, Inc., Milwaukee.
Payne Furnace Co., Beverly Hills, Calif.
Simplex Manufacturing Co., Fond du Lac, Wis.
Totten Co., Grant, Canton, O. (Hoods).
Wilder Mfg. Co., Niles, Ohio.

DRAFT GAGES

See Gages, Draft

DRAFT REGULATORS

See Regulators, Furnace Draft, Mechanical

DRILLS, ELECTRIC, PORTABLE

Albertson & Co., Inc., Sioux City, Iowa.
• Black & Decker Mfg. Co., Towson, Md.
Chicago Pneumatic Tool Co., New York City.
Clark, Jr., Electric Co., Jas., Louisville, Ky.
Independent Pneumatic Tool Co., Chicago.
Keller Tool Company, Grand Haven, Mich. (Pneumatic)
Mall Tool Co., Chicago.
Millers Falls Co., Greenfield, Mass.
Misener Mfg. Co., Inc., Syracuse, N. Y.
Rotor Tool Company, Cleveland (Pneumatic).
Signal Electric Mfg. Co., Menominee, Mich.
Skilsaw, Inc., Chicago.
Snap-on Tools Corp., Kenosha, Wis.
Speedway Mfg. Co., Cicero, Ill.
Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
Van Dorn Electric Tool Co., Towson, Md.
• Wodack Electric Tool Corp., Chicago. (Combination Hammer and Drill).
York Electric and Machine Company, York, Pa.

DRIVE CLEATS

See Connectors, Metal, for Metal Ducts

DRIVES, STOKER

Merkle-Korff Gear Co., Chicago.
Independent Pneumatic Tool Co., Chicago.
Stoker Drive Company, Frederick, Md.
Stokerunit Corp., Milwaukee.

DUCT CONNECTIONS

See Connections, Duct, Flexible

DUCT INSULATION

See Insulation, Duct

DUCT TURNING VANES

See Vanes, Duct Turning

DUCTS AND DUCT FITTINGS, PREFABRICATED

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Berger Furnace Mfg. Co., Pittsburgh.
Champion Furnace Pipe Co., Peoria, Ill.
Chandler Co., Cedar Rapids, Ia.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
General Corporation, Minneapolis.
Gray Metal Products, Inc., Rochester, N. Y.
• Henry Furnace Co., Medina, O.
Howes-Woods Co., Cambridge, Mass.
• International Heater Co., Utica, N. Y.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Moncrief Furnace Co., Atlanta, Ga.
• Mueller Furnace Co., L. J., Milwaukee.
Sioux Steel Co., Sioux Falls, S. D.
Schecter Brothers Co., Philadelphia.
Superior Safety Furnace Pipe Co., Detroit.
Standard Furnace & Supply Co., Omaha, Nebr.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
• Williamson Heater Co., Cincinnati.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NOT METAL

Campbell Engineering Co., Appleton, Wis. (Electric).
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
duPont de Nemours & Co., Inc., E. I., Wilmington, Del. (Rubberized tubing).
Harvey-Whipple, Inc., Springfield, Mass.
Johns-Manville, New York City.
• Sall-Mountain Co., Chicago.
United States Rubber Co., New York City.
Warner Bros. Co., Bridgeport, Conn.
Wiremold Company, Hartford, Conn. (Fabric).

DUST COLLECTORS

See Collectors, Dust

EAVES TROUGH FITTINGS AND ACCESSORIES

See Fittings and Accessories, Eaves Trough and Gutter

EAVES TROUGH AND GUTTERS

• Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, O. (Stainless and galvanized).
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Bayonne Steel Products Co., Newark, N. J.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Edwards Mfg. Co., Inc., Cincinnati.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh.
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee. (Square Hanging).

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• Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Obdyke, Inc., B. P., Philadelphia.
Overly Manufacturing Co., Greensburg, Pa.
Pittsburgh Plate Glass Co., Pittsburgh.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Ryniker Steel Products Co., Billings, Mont.
Saint Paul Corrugating Co., St. Paul, Minn.
Schecter Brothers Co., Philadelphia.
Scheodinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis.
Southern States Iron Roofing Co., Savannah, Ga.
Standard Furnace & Supply Co., Omaha, Nebr.
Tiffin Art Metal Co., Tiffin, Ohio.
Van Noorden Co., E., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
York Corrugating Co., York, Pa.

ELBOW MACHINES

See Machines, Elbow

ELBOWS, BLOW PIPE

See Fittings, Blow Pipe

ELBOWS, CONDUCTOR

See Fittings and Accessories, Conductor

ELBOWS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

ELECTRIC WELDERS

See Welders, Arc, Spot

ELECTRODES, ARC WELDING

• Acme Electric Welder Co., Los Angeles.
Air Reduction Sales Co., New York City.
Allegheny Ludlum Steel Corporation, Pittsburgh.
Aluminum Co. of America, Pittsburgh.
American Agile Corporation, Cleveland.
• American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Arcos Corporation, Philadelphia.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Electric Arc, Inc., Newark, N. J.
Electroloy Company, Inc., Chicago.
Eutectic Welding Alloys Co., New York City.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee.
Hobart Brothers Co., Troy, O.
Hollup Corp., Div., National Cylinder Gas Co., Chicago.
International Nickel Co., New York City.
Laclede Steel Co., St. Louis.
• Lincoln Electric Co., Cleveland.
Marquette Mfg. Co., Inc., Minneapolis.
McKay Co., York, Pa.
Metal & Thermit Corp., New York City.
National Carbon Company, Inc., New York City.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Smith Corporation, A. O., Milwaukee.
Trindl Products, Ltd., Chicago.
Universal Welder Corporation, Cleveland.
Welding Sales & Engineering Co., Detroit.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

ENAMELS AND LACQUERS

See Paints, Finish Coat

EXHAUSTERS, WELDING FUME

• American Machine Products Co., Marshalltown, Ia.
Belanger Fan & Blower Co., Detroit.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Irvington, N. J.
Coppus Engineering Corp., Worcester, Mass.
Day Co., Minneapolis.
Despatch Oven Co., Minneapolis.
Dynamic Air Engineering, Inc., Los Angeles.
General Blower Co., Morton Grove, Ill.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Kirk & Blum Mfg. Co., Cincinnati, O.
Klee Co., George B., Cincinnati.
Martin Fan & Blower Co., Chicago.
Ruemelin Mfg. Co., Milwaukee.
Torit Manufacturing Co., St. Paul, Minn.
Utility Appliance Corporation, Los Angeles.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Wind-Way Fan & Ventilator Co., New Orleans, La.

EXPANSION BOLTS

See Bolts, Expansion

FACES, COLD AIR, METAL

• A-J Manufacturing Co., Kansas City, Mo.
• Air Control Products, Inc., Coopersville, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
• Auer Register Co., Cleveland.
Best Register Co., Milwaukee, Wis.
Controlair Manufacturing Co., Los Angeles.
Diamond Manufacturing Co., Wyoming, Pa.
Greenberg's Sons, M., San Francisco.
Green Colonial Furnace Co., Des Moines, Ia.
• Hart & Cooley Manufacturing Co., Holland, Mich.
Hendrick Manufacturing Co., Carbondale, Pa.
• Independant Register Co., Cleveland, O.
Mundt & Sons, Charles, Jersey City, N. J.
Register & Grille Manufacturing Company, Inc., Brooklyn.
• Rock Island Register Co., Rock Island, Ill.
Schoedinger, F. O., Columbus, O.
• Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.

FACES, COLD AIR, WOOD

Antigo Bldg. Supply Co., Antigo, Wis.
Lockjoint Wood Products Co., Wichita, Kans.
Marsh Lumber Co., Inc., Dover, O.
McClure Builders' Supply Co., East Palestine, O.
• United States Register Co., Battle Creek, Mich.

FAN—FILTER UNITS, PROPELLER

(Separate conversion unit for warm air furnaces)

• Air Controls, Inc., Cleveland.
Mellish & Murray Co., Chicago.
Peerless Electric Co., Warren, O.
Utility Appliance Corporation, Los Angeles.

FAN HOUSINGS

See Housings, Fan

FANS, AXIAL FLOW

Aerovent Fan Co., Piqua, O.
Ampex Electric Corporation, San Carlos, Calif.
Buffalo Forge Co., Buffalo, N. Y.
Buffalo Turbine Corp., Buffalo.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Hartzell Propeller Fan Co., Piqua, Ohio.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Joy Manufacturing Co., La-Del Div., New Philadelphia, O.
Moore Company, Kansas City, Mo. (Pressure Blowers).
Power Engineering Co., Chicago.
Propellair, Inc., Springfield, O.
South Bend Air Products Corp., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Thermo-Aire Division, Evans Products Company, Plymouth, Mich.
Wing Mfg. Co., L. J., New York City.

FANS, BOOSTER, COLD AIR RETURN

Advance Aluminum Castings Corp., Chicago.
Bern's Specialty Mfg. Co., Chicago.
Brumme Mfg. Co., Bloomington, Ill.
Buffalo Turbine Corp., Buffalo.
Cary Mfg. Co., Waupaca, Wis.
General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.
Joy Manufacturing Co., La-Del Div., New Philadelphia, O.
Martin Fan & Blower Co., Chicago.
Mauer Engineering, Evanston, Ill.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Utility Appliance Corporation, Los Angeles.

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FANS, BOOSTER, ONE-PIPE WARM AIR

Advance Aluminum Castings Corp., Chicago.
American Foundry & Furnace Co., Bloomington, Ill.
Brumme Mfg. Co., Bloomington, Ill.
Buffalo Turbine Corp., Buffalo.
Dual-Air Fan Corporation, Chicago.
Martin Fan & Blower Co., Chicago, Ill.
Mauer Engineering, Evanston, Ill.
● Mueller Furnace Co., L. J., Milwaukee.
Victor Electric Products, Inc., Cincinnati.

FANS, FURNACE, PROPELLER TYPE

(Complete with mounting for installation in cold air return)

● Air Controls, Inc., Cleveland.
Belanger Fan & Blower Co., Detroit.
Brumme Mfg. Co., Bloomington, Ill.
Century Fan & Ventilator Co., New York City.
Dual-Air Fan Corporation, Chicago.
Howry-Berg Steel & Iron Works, Denver, Colo.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc. Dayton, O.
Joy Manufacturing Co., La-Del Div., New Philadelphia, O.
Meier Electric & Machine Co., Indianapolis.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Utility Appliance Corporation, Los Angeles.

FANS, KITCHEN EXHAUST

Airmaster Corp., Chicago.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
Arex Co., Chicago.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Bern's Specialty Mfg. Co., Chicago.
● Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
● Clarage Fan Co., Kalamazoo, Mich.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Corp., Detroit.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
King Co., Owantonna, Minn.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
Meyer Manufacturing Co., Detroit.
Myers Electric Co., Pittsburgh.
Nationalaire Corporation, Detroit.
New York Blower Co., Chicago.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
● Pryne & Co., Inc., Los Angeles, Calif.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Shreveport Engineering Co., Inc., Shreveport, La.
Signal Electric Mfg. Co., Menominee, Mich.
Smith Manufacturing Company, Inc., F. A., Rochester, N. Y.
Stewart Manufacturing Co., Indianapolis, Ind.
Stertevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
● Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, La Crosse, Wis.
Universal Blower Co., Birmingham, Mich.
Victor Electric Products, Inc., Cincinnati.
West Wind Corporation, Seattle.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

FANS, NIGHT AIR COOLING, COMPLETE UNIT

● Air Control Products, Inc., Coopersville, Mich.
● Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
● Alton Manufacturing Co., Dallas, Tex.
Allen Corporation, Detroit.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
● American Metal Products Co., Fort Worth, Tex.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Bern's Specialty Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Earl Company, Warren, Houston, Tex.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Co., Chicago.
General Blower Co., Inc., Philadelphia.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
● Holcomb & Hoke Mfg. Co., Inc., Indianapolis.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Jaden Manufacturing Co., Hastings, Nebr.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
King Co., Owatonna, Minn.
● Lakewood Engineering & Mfg. Co., Chicago.
● Lau Blower Co., Dayton, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
Meier Electric & Machine Co., Indianapolis.
Murray Co., Dallas, Tex.
Nationalaire Corporation, Detroit.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
● Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
● Rheem Manufacturing Co., New York City.
Roto-Beam Div., Peerless of America, Chicago.
● Schwitzer-Cummins Co., Indianapolis.
Seco-Lite Manufacturing Co., St. Louis.
Shreveport Engineering Co., Inc., Shreveport, La.
South Bend Air Products, Inc., South Bend, Ind.
Stonewall Company, Chicago.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
● U. S. Air Conditioning Corp., Minneapolis.
Universal Blower Co., Birmingham, Mich.
Utility Appliance Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.
● Viking Air Conditioning Corp., Cleveland.
Ward Co., Edgar T., River Forest, Ill.
Western Blower Co., Seattle, Wash.
Wind-Way Fan & Ventilating Co., New Orleans.
Wood Industries, Inc., Gar, Wayne, Mich.

FANS, VENTILATING, PROPELLER TYPE

(Capacity 4,000 c.f.m. up)

Aerovent Fan Co., Piqua, O.
● Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
Allen Corp., Detroit.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
Arex Co., Chicago.
Arlington Electric Co., St. Louis.
● Bayley Blower Co., Milwaukee.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Bern's Specialty Mfg. Co., Chicago.
● Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
C. & H. Air Conditioning Fan Co., Inc., Atlanta, Ga.
Campbell Heating Company, E. K., Kansas City, Mo.
Century Fan & Ventilator Co., New York City.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Chicago Fan & Fin Coil Co., Chicago.
Circulators & Devices Mfg. Corp., New York City.
● Clarage Fan Co., Kalamazoo, Mich.
Coppus Engineering Corporation, Worcester, Mass.
Dallas Eng. Co., Inc., Dallas, Tex.
De Bothezat Fans Division, American Machine & Metals, Inc., East Moline, Ill.
DeVilbiss Company, Toledo.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Duriron Co., Inc., Dayton, O. (Acid Resisting).
Dynamic Air Engineering, Inc., Los Angeles.
Earl Company, Warren, Houston, Tex.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Ford Blow Pipe & Manufacturing Co., Memphis, Tenn.
Fresh'nd-Aire Co., Chicago.
General Blower Co., Morton Grove, Ill.
Goettl Bros. Phoenix, Ariz.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
● Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
Holden Fan Co., Detroit.
Howry-Berg Steel & Iron Works, Denver, Colo.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Johnson Fan & Blower Corp., Chicago.

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Jordan & Co., Paul R., Indianapolis.
Joy Manufacturing Co., La-Del Div., New Philadelphia, O.
King Co., Owatonna, Minn.
Kisco Company, Inc., St. Louis.
Klee Co., George B., Cincinnati.
• Lakewood Engineering & Mfg. Co., Chicago.
• Lau Blower Co., Dayton, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
McCord Corporation, Detroit.
Meier Electric & Machine Co., Indianapolis.
Moore Company, Kansas City, Mo.
Mountain States Equipment Co., Denver, Colo.
Myers Electric Co., Pittsburgh.
• Naco Manufacturing Co., Huntington Park, Calif.
Nationalaire Corporation, Detroit.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Newcomb Engineering Co., Grand Rapids, Mich.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Company, Chicago.
Roto-Beam Div., Peerless of America, Inc., Chicago.
• Schwitzer-Cummins Co., Indianapolis.
Seco-Lite Manufacturing Co., St. Louis.
Shreveport Engineering Co., Inc., Shreveport, La.
Signal Electric Mfg. Co., Menominee, Mich.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hdye Park, Mass.
• Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, La Crosse, Wis.
Trufio Fan Co., Harmony, Pa.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
Ward Co., Inc., Edgar T., River Forest, Ill.
Water Cooling Equipment Corp., St. Louis.
Western Blower Co., Seattle, Wash.
• Western Engineering & Mfg. Co., Los Angeles.
Wind-Way Fan & Ventilating Co., New Orleans.
Wing Mfg. Co., L. J., New York City.

FASTENINGS FOR SHEET METAL

Cuyahoga Spring Company, Cleveland.
Shakeproof, Inc., Chicago.
Tinnerman Products, Inc., Cleveland.
United-Carr Fastener Corporation, Cambridge, Mass. (Studs, staples, receptacles, clips, speednuts, etc.).

FELT, ROOFING

Barber Co., Inc., Philadelphia.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Carey Co., Philip, Lockland, O.
Certain-teed Products Corp., New York City.
Detroit Steel Products Co., Detroit.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Globe Roofing Products Co., Inc., Whiting, Ind.
Johns-Manville, New York City.
Koppers Co., Inc., Pittsburgh. (Pitch and Felt).
Lehon Company, Chicago.
National Mfg. Corp., Tonawanda, N. Y.
Ohio Paper Co., Miamisburg, Ohio.
• Owens-Corning Fiberglas Corporation, Toledo, O.
• Proie & Coogan Heating Co., Pittsburgh.
Reilly Tar & Chemical Corp., Indianapolis.
Ruberoid Co., New York City.
United States Gypsum Co., Chicago.

FILTERS, AIR AUTOMATIC

Air Stream Filter Corp., St. Louis.
Air & Refrigeration Corp., New York City.
American Air Filter Co., Inc., Louisville, Ky. (Electronic Precipitator).
Continental Air Filters, Inc., Louisville, Ky.
Dollinger Corporation, Rochester, N. Y.
Raytheon Mfg. Co., Waltham, Mass. (Electrostatic).
Westinghouse Electric Corp., Cleveland (Electrostatic Precipitator).

FILTERS, AIR, UNIT, CLEANABLE

• Air Devices, Inc., New York City. (Steel wire mesh).
Air Filter Corporation, Milwaukee.
Air Filter Engineering Co., Chicago. (Galvanized wire cloth).
Air Maze Corp., Cleveland (Metal-Wire Baffles).
Air Stream Filter Corp., St. Louis.
American Air Filter Co., Inc., Louisville, Ky. (Steel wool).
Annis, Emmett F., Glendale, Calif. (Felt).
Chicago Filter Co., Joliet, Ill.
Continental Air Filters, Inc., Louisville, Ky. (Metal).
Coppus Engineering Corp., Worcester, Mass. (Felt).
Dollinger Corporation, Rochester, N. Y. (Feltex, Glastex, heat resistant cotton).
Drico Industrial Corporation, New York City (Felt).
Dri-Steam Products, Inc., New York City.
Farr Company, Los Angeles (Metal Screen).
Kauffman Air Conditioning Corp., St. Louis.
Nationalaire Corporation, Detroit (Spun Glass).
• Research Products Corporation, Madison, Wis. (Metal).
Somers, Inc., H. J., Detroit (Hair, Glass).
Universal Air Filter Corp., Duluth, Minn. (Cellulose).

FILTERS, AIR, UNIT, THROWAWAY

American Air Filter Co., Inc., Louisville, Ky.
Chicago Filter Co., Joliet, Ill.
Detroit Air Filter Co., Chicago (Fibreboard).
Drico Industrial Corporation, New York City (Felt).
Master Products Co., Inc., Chicago (Keratin fibre).
Morf Industries, Staten Island, N. Y. (Glass, wire mesh).
• Owens-Corning Fiberglas Corp., Toledo, O. (Fiberglas).
• Research Products Corp., Madison, Wis. (Expanded flameproofed kraft fibre).
Sanit-Air Products Co., South Bend, Ind. (Register-steel wool).
Universal Air Filter Corp., Duluth, Minn. (Cellulose).
• Wilson & Co., Inc., Chicago (Animal Hair).

FIRE BRICK

See Refractories

FIREPOTS

See Repairs, Stove and Furnace

FIRING TOOLS

See Tools, Firing

FITTINGS AND ACCESSORIES, CONDUCTOR

(Elbows, Heads, Hooks, Shoes, Straps, etc.)

• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, O.
Atchison Specialty Mfg. Co., Atchison, Kan. (Scuppers, drains).
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Crary Mfg. Co., Middleport, O. (Cut-off).
Dieckmann Co., Ferdinand, Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Galvan Manufacturing Co., New Albany, Ind. (Cut-offs).
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Gray Metal Products, Inc., Rochester, N. Y.
• Hussey & Co., C. G., Pittsburgh.
Iwan Bros. South Bend, Ind.
Josam Manufacturing Co., Cleveland (Drains and scuppers).
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
• Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Milwaukee.
• Milcor Steel Co., Milwaukee.
• Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, Ohio.
Obdyke, Inc. B. P. Philadelphia.
Rattan Mfg. Co., New Haven, Conn.
Rival Strap Corp., New York City (Ornamental Conductor Straps).
Royal-Apex Mfg. Corp., Brooklyn.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Sioux Steel Co., Sioux Falls, S. D.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.

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FITTINGS AND ACCESSORIES, EAVES TROUGH AND GUTTER

(Hangers, Strainers, Miters, Ends, Thimbles, etc.)

Abbott Mfg. Co., Painesville, O. (Hangers).
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Blake Manufacturing Co., Rock Island, Ill. (Drains).
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Downs-Smith Brass & Copper Co., New York City.
Eav-Tex Company, Upper Darby, Pa. (Roof Gutter Protection).
Edwards Mfg. Co., Inc., Cincinnati.
Famous Furnace Co., Cleveland (Strap hangers end caps).
Galvan Manufacturing Co., New Albany, Ind. (Cut-offs).
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Grand Rapids Wire Products Co., Grand Rapids, Mich.
Gray Metal Products, Inc., Rochester, N. Y.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh (Copper).
Iwan Brothers, South Bend, Ind.
Klauer Mfg. Co., Dubuque, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y., (Eaves trough, hangers, miters).
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
• Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
Obdyke, Inc., B. P. Philadelphia.
Ohio Wire Products Co., Dover, O. (Hangers).
Penn Supply & Metal Corp., Philadelphia.
Pioneer Tool Company, Racine, Wis. (Gutter Clamp).
Reeves Steel & Mfg. Co., Dover, O.
Reynolds Metals Company, Louisville, Ky. (Aluminum).
Royal-Apex Mfg. Corp., Brooklyn.
Saint Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Sioux Steel Co., Sioux Falls, S. D.
Snap-On Mfg. Co., Chicago (Hangers).
Souther Iron Co., E. E., St. Louis.
Southern States Iron Roofing Co., Savannah, Ga.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio (Clamp).
Wade Manufacturing Co., Elgin, Ill. (Roof Drains).
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
Zurn Mfg. Co., J. A., Erie, Pa. (Roof Drains).

FITTINGS AND ACCESSORIES, FURNACE PIPE

(Angles, Boots, Elbows, Heads, Joints, Offsets, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.
Acme Furnace Fittings Co., Chicago.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Company, Columbus, Ohio.
Berger Furnace Mfg. Co., Pittsburgh.
Bergstrom Mfg. Corp., Neenah, Wis.
Bieler & Son, Long Island City. (Adjustable elbows).
Braden Mfg. Co., Terre Haute, Ind.
Cary Mfg Co., Waupaca, Wis.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farquhar Furnace Co., Wilmington, O.
Fraser & Johnston Co., San Francisco.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines, Ia.
• Henry Furnace Company, Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Howes-Woods Company, Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Keith Furnace Company, Des Moines, Iowa.
• Krauser-Boyd, Inc., North Tonawanda, N. Y. (Elbows).
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis. (Elbows and pipe only).
Lennox Furnace Co., Marshalltown, Ia.
Los Angeles Sheet Metal Manufacturing Co., Inc., Los Angeles
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Manufacturing Company, C. A., Elyria, Ohio.
Payne Furnace Co., Beverly Hills, Calif.
• Peerless Foundry Co., Indianapolis.
Penn Supply & Metal Corporation, Philadelphia.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Company, Dowagiac, Mich.
Ralph Supply Co., Inc., Wadsworth, Ohio.
Reeves Steel & Mfg. Co., Dover, O.
• Rock Island Register Co., Rock Island, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Specialty Co., Pittsburgh.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
• Superior Products Co., Omaha, Nebr.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Tri-State Heating Supply Company, Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williamson Heater Co., Cincinnati.

FITTINGS AND ACCESSORIES, OIL BURNERS

Ampion Corporation, Long Island City (Oil Tank Solvent)
Applied Mechanics Co., Boston (Oil Tank Gauge).
• Bearlee Products Co., Green Bay, Wis. (Tank Gauge).
Bristol Co., Waterbury, Conn. (Liquid Level Gauge).
Commercial Filters Corp., Boston (Fuel oil filters).
Delavan Engineering Co., Des Moines, Ia. (Nozzles).
Fisher Governor Company, Marshalltown, Ia. (Liquid Level Controller).
Gas & Oil Industry Laboratories, Inc., Irvington, N. J. (Valves).
• General Filters, Inc., Detroit (Filters).
• Hasko Utilities Co., New York City (Fuel Oil Gages, nozzles, strainers).
• Jessup Signal Gauge Co., Minneapolis (Oil tank watchman).
• Krueger Sentry Gauge Co., Green Bay, Wis. (Liquid level gauge).
Liquidometer Corp., Long Island City (Liquid level gauge).
Mel-Gauge Co., East Haven, Conn. (Liquid Level).
Morse, Smith & Morse, Inc., Watertown, Mass. (Safety Device)
Petroleum Solvents Corporation, New York City (Oil Tank Solvent).
Rajah Company, Bloomfield, N. J. (Wiring Crimper and Terminals).
Rega Manufacturing Company, Rochester, N. Y. (Filters).
Shell Oil Co., New York City (Combustion head).
Scully Signal Company, Cambridge, Mass. (Oil Tank Gauge).

FITTINGS AND ACCESSORIES, SMOKE PIPE

(Draw-bands, Clean-outs, Collars, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Company, Columbus, Ohio.
Bardes Range & Foundry Co., E. H., Cincinnati.
Berger Furnace Mfg. Co., Pittsburgh.
Bergstrom Mfg. Corp., Neenah, Wis.
Bieler & Son, L., Long Island City, N. Y.
Braden Mfg. Co., Terre Haute, Ind.
Cary Mfg. Co., Waupaca, Wis.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Cincinnati Stamping Co., Cincinnati, Ohio.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Famous Furnace Co., Cleveland.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines, Ia.
• Henry Furnace Company, Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Homer Furnace & Foundry Corporation, Coldwater, Mich.
Howes-Woods Company, Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.

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Keith Furnace Company, Des Moines, Ia.
Kirk & Blum Mfg. Co., Cincinnati.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Company, Newark, Ohio.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
• Patten Co., J. V., Sycamore, Ill.
Peacard Co., M. A., Boston.
• Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Company, Dowagiac, Mich.
Reeves Steel & Mfg. Co., Dover, O.
• Rock Island Register Co., Rock Island, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
• Superior Products Co., Omaha, Nebr.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tierney Rotor Ventilator Co., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Tri-State Heating Supply Company, Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
Wilder Manufacturing Co., Niles, O.
• Williamson Heater Co., Cincinnati.

FITTINGS, BLOW PIPE

(Elbows, Flanges, Hangers, Hoods and Sweeps, Joints, Rings, Tubing)

• Ajax Furnace Fitting Co. Div. Sheet Metal & Roofing Co., Cincinnati.
Chicago Metal Mfg. Co., Chicago.
Day Co., Minneapolis.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Kirk & Blum Mfg. Co., Cincinnati (Adjustable Buffing Hoods).
• National Metal Fabricators, Chicago.
Newcomb Engineering Co., Grand Rapids, Mich.
Northern Blower Co., Cleveland.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Schmieg Industries, Detroit.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Sleeth & Son, J. E., Spokane, Wash.
Sturtevant Company, B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee.
Young & Bertke Co., Cincinnati.

FITTINGS, COPPER TUBE, COMPRESSION AND FLARED

• American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Commonwealth Brass Corp., Detroit.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Crane Co., Chicago.
Downs-Smith Brass & Copper Co., Inc., New York City.
Everhot Products Co., Chicago.
Grinnell Co., Inc., Providence, R. I.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago.
Kerotest Mfg. Co., Pittsburgh.
Northern Indiana Brass Co., Elkhart, Ind.
Packless Metal Products Corp., New Rochelle, N. Y.
Parker Appliance Co., Cleveland.

FITTINGS, HUMIDIFIER, WATER LINE

• American Brass Co., Waterbury, Conn.
Beckett & Co., Thomas, Dallas, Tex.
Hays Mfg. Co., Erie, Pa.
• McDonnell & Miller, Chicago.
• Maid-O'-Mist, Inc., Chicago.
Mueller Brass Co., Port Huron, Mich.
Parker Appliance Co., Cleveland.
Reichert Float & Mfg. Co., Toledo, O.
• Skuttle Manufacturing Co., Detroit.

FLANGERS

See Machines, Flanging

FLANGES, BLOW PIPE

See Fittings, Blow Pipe

FLASHINGS, ROOF, PATENTED

Alpha Metals, Inc., Brooklyn.
• American Rolling Mill Co., Middletown, Ohio (Galvanized).
Barrett Division, Allied Chemical & Die Corporation, New York City (for brick and concrete).
Berger Mfg. Div. Republic Steel Co., Canton, Ohio.
Biersach & Niedermeyer Co., Milwaukee.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cheney Industries, Trenton, N. J.
Eagle-Picher Co., Cincinnati.
Edwards Mfg. Co., Inc., Cincinnati.
Figge Mfg. Co., Chicago.
Flemm Lead Company, Inc., Long Island City, N. Y.
• Hussey & Co., C. G., Pittsburgh.
Keystone Flashing Company, Philadelphia.
Majestic Flashing Company, Baltimore.
• Milcor Steel Co., Milwaukee.
National Lead Company, New York City.
New Delphos Manufacturing Co., Delphos, Ohio.
Plasteel Products Co., Washington, Pa.
Schoedinger, F. O., Columbus, O.
Simplex Manufacturing Co., Fond du Lac, Wis.
Sisalkraft Co., Chicago.
Vallas, Lionel, Chicago.
Van Noorden Co., E., Boston.
• Williams-Wallace Co., San Francisco.
York Corrugating Co., York, Pa.

FLASHINGS, THROUGH-WALL, PATENTED

• American Brass Co., Waterbury, Conn. (Copper).
Biersach & Niedermeyer Company, Milwaukee.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cheney Industries, Trenton, N. J.
Figge Mfg. Co., Chicago.
Majestic Flashing Company, Baltimore.
New Delphos Manufacturing Co., Delphos, Ohio.
• Revere Copper and Brass Incorporated, New York City.
Wasco Flashing Co., Cambridge, Mass.

FLOOR FURNACES

See Furnaces, Warm Air, Floor

FLUE GAS ANALYZERS

See Analyzers, CO_2, Portable

FLUX, SOLDERING

Air Reduction Sales Company, New York City (All).
• Allen Co., Inc., L. B., Chicago (Aluminum, Copper, Gal. Iron, Stainless Steel, Chrome, Old Metal Tinning).
American Solder & Flux Co., Philadelphia, Pa.
Bastian-Blessing Co., Chicago.
Belmont Smelting & Refining Works, Inc., Brooklyn (Aluminum, Stainless).
Benson Co., Inc., Alex R., Hudson, N. Y. (Salts, Pastes for Copper, Galvanized, Stainless).
Burnley Battery & Mfg. Co., North East, Pa. (Paste, Salts, Solution), (Copper, Galvanized Iron).
Carajon Chemical Co., Fremont, Mich. (Solution, Stainless).
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Copper sweat fittings).
Diener Mfg Co., Geo. W., Chicago.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Copper, Galvanized iron).
Eutectic Welding Alloys Co., New York City (Aluminum, Copper, Galvanized Iron, Stainless).
Farrelloy Company, Inc., Philadelphia.
Flux-All Chemical Products, New York City. (Stainless).
Garden City Laboratory, Inc., Chicago.
General Electric Co., Bridegport, Conn.
Glaser Lead Co., Inc., Brooklyn (Every purpose).
Handy & Harman, New York City (Copper, galvanized iron, brass, bronze, nickel, nickel alloys, stainless).
Industrial Service Laboratories, Milwaukee (Stainless, Galvanized iron, Copper).
Johnson Co., Lloyd S., Chicago (Aluminum, stainless steel, copper, galvanized iron).
• Johnson Gas Appliance Co., Cedar Rapids, Iowa.
Kester Solder Co., Chicago (Viscosiformed Paste, Trichloron Salts, Stainless Steel—Paste and Salts).
• Langsenkamp Co., F. H., Indianapolis (Stainless steel).
Lewis Laboratories, Inc., Paul, Milwaukee (Low Tin Content).
Linde Air Products Co., New York City (Aluminum, copper, galv. iron, stainless).
Lukens Metal Co., Thos. F., Philadelphia (Copper, Galvanized Iron, Stainless Steel).
Motex Metal Process Corporation, Detroit.
National Cylinder Gas Co., Chicago.
Neilson Chemical Co., Detroit (For Steel).

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Pfanstiehl Chemical Co., Waukegan, Ill. (Copper, galv. iron, stainless).
Potomac Mfg. Co., Philadelphia (All metals).
● Reiner & Campbell Co., Inc., Elizabeth, N. J.
● Ruby Chemical Co., Columbus, O. (Liquid and Paste for copper, galv. iron, stainless).
Sherman & Co., New York City.
Smith Welding Equipment Corporation, Minneapolis (Aluminum).
Superior Flux Co., Cleveland (Aluminum, copper, iron, magnesium, stainless).
Technical Processes Div., Colonial Alloys Co., Philadelphia.
● Tinit Manufacturing Co., Denver, Colo. (All metals).
Turco Products, Inc., Los Angeles.
Universal Welder Corporation, Cleveland.
Wolfe-Kote Co., Sheboygan, Wis.

FUEL OIL FILTERS

See Fittings and Accessories, Oil Burner

FUEL UNITS FOR OIL BURNERS

See Units, Fuel, for Oil Burners

FURNACE BLOWERS

See Blowers, Furnace, Centrifugal

FURNACE-BURNER UNITS

See Furnaces, Warm Air

FURNACE CEMENT

See Cement, Furnace

FURNACE CLEANERS

See Cleaners, Vacuum, Furnace

FURNACE COVERING

See Insulation, Furnace and Pipe

FURNACE LIGHTERS

See Lighters, Furnace

FURNACE LINING

See Refractories

FURNACE PIPE

See Pipe, Furnace

FURNACE PIPE FITTINGS AND ACCESSORIES

See Fittings and Accessories, Furnace Pipe

FURNACE REGULATORS

See Regulators, Furnace Draft, Mechanical and Motors, Damper, Furnace Draft, Electrical

FURNACE REPAIRS

See Repairs, Stove and Furnace

FURNACES FOR LARGE BUILDINGS

(800,000 Btu and up)

● Airtherm Manufacturing Co., St. Louis.
Beck Engineering Combustion Kompany, St. Louis (Coal, Oil, Gas).
Campbell Heating Co., Des Moines, Ia.
● Certified Furnace Co. Div. Stainless & Steel Products Co., St. Paul, Minn.
● Chicago Steel Furnace Co., Chicago (Gas or Oil).
Dravo Corporation, Pittsburgh.
● Hall-Neal Furnace Co., Indianapolis, Ind.
International Sales Co., San Francisco.
Jackson & Church Co., Saginaw, Mich. (Coal, Oil, Gas).
Lee Engineering Co., Youngstown, Ohio (Hand and stoker—oil, gas, comb. oil-gas).
Lennox Furnace Co., Marshalltown, Iowa.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill. (Gas, oil, coal).
● Mueller Furnace Company, L. J., Milwaukee (Coal, oil).
National Heater Co., Minneapolis.
Northwest Foundry & Furnace Co., Inc., Portland, Ore.
Payne Furnace Company, Pasadena, Cal.
● Peerless Foundry Co., Inc., Indianapolis.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Vacuum Gas Appliances, Rome, N. Y. (Dust Heater).
Weatherall Engineers, Inc., Providence, R. I.

FURNACES, SOLDERING

Acme Electric Heating Co., Inc., Boston.
Aeroil Products Co., West New York, N. J.
Bernz Co., Otto, Rochester, N. Y.
Burgess Soldering Furnace Co., Columbus, O. (Gasoline).
● Clayton & Lambert Mfg. Co., Dearborn, Mich.
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hones, Inc., Charles A., Baldwin, N. Y. (Gas).
● Johnson Gas Appliance Co., Cedar Rapids, Ia.
Mutual Liquid Gas & Equipment Co., Inglewood, Calif.
● Peck, Stow & Wilcox Co., Southington, Conn.
Pennsylvania Furnace & Iron Co., Warren, Pa.
● Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Cedar Rapids, Ia.
Sanders, J. A., Fulton, N. Y.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago. (Gasoline, kerosene).
Vulcan Electric Co., Danvers, Mass.
Ward Machinery Co., Chicago (Gas).
Weiss & Co., H., New York City.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

FURNACES, WARM AIR

(Floor—for Suspension beneath Floor)

Advance Furnace Co., Wichita, Kansas.
Air Products, Inc., Pittsburg, Kans.
Aladdin Heating Corp., Oakland, Calif.
● American Radiator & Standard Sanitary Corp., Pittsburgh. (Gas, Oil).
Anchor Burner Co., Oklahoma City, Okla. (Gas).
Andrews Heater Co., Los Angeles. (Gas).
Armstrong Furnace Company, Columbus, Ohio (Gas).
Atlas Heating and Ventilating Co., Ltd., San Francisco.
● Barnes Heating and Ventilating Co., Long Beach, Cal. (Gas).
Beck Engineering Combustion Kompany, St. Louis.
● Bryant Heater Co., Cleveland (Gas).
Cole Hot Blast Manufacturing Co., Chicago (Gas and Oil).
● Coleman Co., Inc., Wichita, Kans. (Oil, gas and LP Gas).
Commonwealth Company, Alhambra, Calif.
Dearborn Stove Co., Dallas, Texas (Gas).
DeLuxe Furnace & Wall Heater Co., Los Angeles.
Empire Stove Co., Belleville, Ill. (Gas).
Ford Blow Pipe & Manufacturing Co., Memphis, Tenn. (Gas).
Fraser & Johnston Co., San Francisco.
Fraser Furnace Co., Inc., Stockton, Calif.
General Wesco Stove Co., Springfield, Mo. (Gas).
● Gillen Company, J. L., Dowagiac, Mich. (Oil).
Gilmore & Co., Jackson G., Columbus, O. (Oil).
Hammel Radiator Engineering Co., Los Angeles.
Hart-Mun Furnace Co., Tulsa, Okla. (Gas).
Heating Equipment Co., San Francisco (Gas).
● Holly Manufacturing Co., Pasadena, Calif. (Gas).
Hotstream Heater Co., Cleveland.
International Sales Co., San Francisco (Gas).
King Metal Co., Oklahoma City, Okla. (Gas).
● Kresky Mfg. Co., Petaluma, Calif. (No 3 oil).
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil).
● Mahl Manufacturing Co., Huntington Park, Calif. (Gas).
Miller Floor Furnace Co., Oakland, Calif.
Monarch Heating Co., Los Angeles (Gas).
Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
● Naco Manufacturing Co., Huntington Park, Calif. (Gas).
● Norge Heat Div., Borg-Warner Corp., Detroit (Oil).
Pacific Gas Heating Co., San Francisco (Gas).
Payne Furnace Co., Beverly Hills, Calif. (Gas).
Peerless Manufacturing Corporation, Louisville, Ky. (Gas).
Pennsylvania Furnace & Iron Co., Warren, Pa.
Quaker Manufacturing Co., Chicago (Oil).
● Rheem Manufacturing Co., New York City (Gas).
● Royal Heaters, Inc., Alhambra, Calif. (Dual-Gas).
Samuel Stamping & Enameling Company, Chattanooga, Tenn. (Gas).
Security Manufacturing Co., Kansas City, Mo. (Gas).
Sequoia Manufacturing Co., San Carlos, Calif. (Gas, oil).
Shaw Burner Company, Inc., Arkansas City, Kans. (Gas or Butane).
Spartan Aircraft Co., Tulsa, Okla. (Gas).
Stoker-Lad Co., Tacoma, Wash. (Oil).
Sunshine Mantle Co., Chanute, Kansas.
Surface Combustion, Toledo, O. (Gas).
Tennessee Enamel Mfg. Co., Nashville, Tenn.
U-Ni-Matic Heating Systems, Inc., Los Angeles. (Gas).
Universal Metal Products, Los Angeles (Gas).
Utility Appliance Corporation, Los Angeles (Gas, butane).
Viking Manufacturing Corporation, Cleveland (Oil).
Ward Heater Co., Los Angeles, Calif. (Gas).
● Zink Co., John, Tulsa, Okla. (Gas).

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

(Horizontal)

American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Campbell Heating Co., E. K., Kansas City, Mo.
• Certified Furnace Company, St. Paul, Minn.
Columbus Heating & Ventilating Co., Columbus, O.
Dravo Corporation, Pittsburgh.
Floral City Co., Monroe, Mich.
International Sales Co., San Francisco. (Gas).
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
McPherson Furnace & Supply Co., Portland, Ore.
Moncrief Furnace Co., Atlanta, Ga.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
National Heater Company, Minneapolis.
Northwest Foundry & Furnace Co., Portland, Ore.
Rosebraugh Co., W. W., Salem, Ore.
Sandberg Co., H. J., Portland, Ore.
Twentieth Century Heating & Ventilating Co., Akron, O.
Western Blower Co., Seattle, Wash.
Western Furnaces, Inc., Tacoma, Wash.
XXth Century Heating & Ventilating Co., Akron, O.

(Pipeless—Cast Iron)

Agricola Furnace Co., Inc., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
• American Radiator & Standard Sanitary Corp., Pittsburgh.
Barry Furnace Co., Hamilton, O.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Edwards Furnace Co., Wellsboro, Pa.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Favorite Stove Co., Piqua, O.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hart & Crouse Corporation, Utica, N. Y.
• Henry Furnace Co., Medina, O.
Home Furnace Co., Holland, Mich.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Independence Stove & Furnace Co., Independence, Mo.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Mfg. Co., C. A., Elyria, O.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Clair Foundry Corp., Centralia, Ill.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
United States Radiator Corp., Detroit.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

(Pipeless—Steel)

Aladdin Heating Corp., Oakland, Calif.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Campbell Heating Co., Des Moines, Ia.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Grossenbacher Furnace Co., St. Louis.
• Hess Warming & Ventilating Co., Chicago.
Home Stove Co., Indianapolis.
• International Heater Co., Utica, N. Y.
• Jackson & Church Co., Saginaw, Mich.
• Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Lennox Furnace Co., Marshalltown, Ia.
• May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
• Naco Manufacturing Co., Huntington Park, Calif.
Northwest Foundry & Furnace Co., Portland, Ore.
Nugent Furnaces, Thos., New York City.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Rosebraugh Co., W. W., Salem, Ore.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
• Thatcher Furnace Company, Garwood, N. J.
United States Radiator Corp., Detroit.
• Waterman-Waterbury Co., Minneapolis, Minn.

(Wall—To be built into partitions)

Aladdin Heating Corporation, Oakland, Calif.
Andrews Heater Co., Los Angeles, Calif.
Commonwealth Company, Alhambra, Calif.
Hammel Radiator Engineering Company, Los Angeles (Gas).
• Holly Mfg. Co., Pasadena, Calif.
International Sales Co., San Francisco (Gas).
Lawson Manufacturing Co., Pittsburgh.
Mahl Manufacturing Co., Huntington Park, Calif. (Gas).
Peerless Manufacturing Corporation, Louisville, Ky. (Gas).
• Rheem Mfg. Co., New York City (Gas).
• Royal Heaters, Inc., Alhambra, Calif. (Dual-Gas).
Ray-Glo, Inc., Shelbyville, Ind.
Thompson Mfg. Co., A. F., Huntington, W. Va.
U-Ni-Matic Heating Systems, Inc., Los Angeles (Gas).
Williams Radiator Company, Los Angeles.
• Zink Co., John, Tulsa, Okla.

FURNACES, WARM AIR, AIR CONDITIONING

Coal, Cast Iron

(Matched furnace, fan, filter and humidifier unit, shipped complete)

Agricola Furnace Co., Inc., Gadsden, Ala.
• Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
• American Radiator and Standard Sanitary Corp., Pittsburgh
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Company, Springfield, Ill.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hart & Crouse Corp., Utica, N. Y.
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
• International Heater Co., Utica, N. Y.
• Kehm Corporation, Chicago.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Mfg. Co., C. A., Elyria, O.
• Premier Furnace Co., Dowagiac, Mich.
• Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Sioux City Foundry & Boiler Company, Sioux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

Coal, Steel

Airwasher Corporation, Eaton Rapids, Mich.
• Airtemp Div., Chrysler Corp., Dayton, O.
• American Furnace Co., St. Louis.
• American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.
Bard Manufacturing Co., Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Berger Furnace Mfg. Co., Pittsburgh.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
• Certified Furnace Company, St. Paul, Minn.
• Chicago Heat-Master Co., Chicago.
• Cleveland Steel Products Corp., Toridheet Div., Cleveland.
Deshler Foundry & Machine Works, Deshler, Ohio.
• Dowagiac Steel Furnace Company, Dowagiac, Mich.
Excelsior Steel Furnace Co., Chicago.
Farquhar Furnace Co., Wilmington, O.
• Fitzgibbons Boiler Company, Inc., New York City.
Floral City Co., Monroe, Mich.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.

- Furblo Company, Hermansville, Mich.
  Green Colonial Furnace Co., Des Moines, Ia.
  Grossenbacher Furnace Co., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
  Heatlox Furnaces, Inc., Tacoma, Wash.
- Henry Furnace Company, Medina, Ohio.
  Hess-Snyder Co., Massillon, O.
- Hess Warming & Ventilating Co., Chicago.
  Homer Furnace & Foundry Corp., Coldwater, Mich.
  Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago.
- International Heater Co., Utica, N. Y.
- Jackson & Church Co., Saginaw, Mich.
  Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
  Keith Furnace Co., Des Moines, Ia.
  Kelsey Heating Co., Inc., Syracuse, N. Y.
  Lennox Furnace Co., Marshalltown, Ia.
  McPherson Furnace & Supply Co., Portland, Ore. (Also sawdust and wood burning).
- Majestic Co., Huntington, Ind.
  Marshall Furnace Co., Marshall, Mich.
- May-Fiebeger Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
  Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee.
- Norge Heat Div., Borg-Warner Corporation, Detroit.
  Northwest Foundry & Furnace Co., Portland, Ore.
- Olsen Mfg. Co., C. A., Elyria, O.
  Portland Stove Foundry Co., Portland, Me.
  Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
  St. Louis Furnace Manufacturing Co., St. Louis.
  Sandberg Co., H. J., Portland, Ore.
  Schill Mfg. Co., Crestline, O.
  Smith Heater Co., Peter, Dearborn, Mich.
- Syncromatic Corporation, Watertown, Wis.
  United States Radiator Corporation, Detroit.
- Waterman-Waterbury Co., Minneapolis.
  Westwick & Son, Inc., John, Galena, Ill.
- Williamson Heater Co., Cincinnati.

Gas, Cast Iron

- Airtemp Div., Chrysler Corp., Dayton, O.
  American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Company, St. Louis.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
  Andrews Heating Company, Minneapolis.
  Bastian-Morley Co., Inc., LaPorte, Ind.
  Beck Engineering Combustion Kompany, St. Louis.
- Bryant Heater Co., Cleveland.
  Coroaire Heater Corporation, Cleveland.
- Forest City Foundries Co., Cleveland, O.
  General Bronze Corporation, Long Island City.
  General Electric Co., Bloomfield, N. J.
  Green Colonial Furnace Co., Des Moines, Ia.
- Henry Furnace Company, Medina, Ohio.
  Hess-Snyder Co., Massillon, O.
- International Heater Co., Utica, N. Y.
  Kelsey Heating Co., Inc., Syracuse, N. Y.
  Moncrief Furnace & Mfg. Co., Dallas, Texas.
- Mueller Furnace Co., L. J., Milwaukee.
- Olsen Manufacturing Co., C. A., Elyria, O.
  Pennsylvania Furnace & Iron Co., Warren, Pa.
- Premier Furnace Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
  Security Manufacturing Co., Kansas City, Mo.
- Silver Flame Inc., Detroit.
  Sioux City Foundry and Boiler Company, Sioux City, Ia.
  Surface Combustion, Toledo, O.
- Thatcher Furnace Co., Garwood, N. J.
  Vacuum Gas Appliances, Rome, N. Y.
  Viking Mfg. Corp., Cleveland.
  XXth Century Heating & Ventilating Co., Akron, O.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
  Wood Industries, Inc., Gar., Wayne, Mich.

Gas, Steel

Advance Furnace Co., Wichita, Kans.
- Airtemp Div., Chrysler Corp., Dayton, O.
  Aladdin Heating Corporation, Oakland, Calif.
- American Furnace Company, St. Louis.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
  Andrews Heating Company, Minneapolis.
  Andrews-Schroeder Heating Co., Inc., Glendale, Calif.
  Armstrong Furnace Co., Columbus, O.
  Auburn Burner Co., Auburn, Ind.
  Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.
  Bard Mfg. Co., Bryan, O.
  Beck Engineering Combustion Kompany, St. Louis.
  Berger Furnace Mfg. Co., Pittsburgh.
  Brown Steel Tank Co., Minneapolis.
- Bryant Heater Co., Cleveland.
  Campbell Heating Company, Des Moines, Ia.
  Campbell Heating Co., E. K., Kansas City, Mo.
- Century Engineering Corporation, Cedar Rapids, Ia.
- Certified Furnace Company, St. Paul, Minn.
  Chandler Company, Cedar Rapids, Ia.
- Conco Engineering Works, Mendota, Ill.
  Dalzen Tool & Manufacturing Co., Detroit.
  Dornback Furnace & Foundry Co., Cleveland.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
  Farquhar Furnace Company, Wilmington, Ohio.
- Fitzgibbons Boiler Co., Inc., New York City.
  Floral City Company, Monroe, Mich.
- Forest City Foundries Co., Cleveland.
  Fraser Furnace Co., Inc., Stockton, Calif.
  Frazer and Johnston Co., San Francisco.
  Gaul Air Conditioner Co., Dayton, Ohio.
  General Bronze Corporation, Long Island City.
  General Gas Light Co., Kalamazoo, Mich.
  Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.
  Green Colonial Furnace Co., Des Moines, Ia.
  Grossenbacher Furnace Co., St. Louis.
  Haldeman, Inc., Harry F., Los Angeles.
- Hall-Neal Furnace Co., Indianapolis, Ind.
  Hammel Radiator Engineering Co., Los Angeles, Cal.
  Heating Equipment Co., San Francisco.
- Heil Co., The, Milwaukee.
  Henderson Furnace & Mfg. Co., Sebastopol, Cal.
- Henry Furnace Company, Medina, Ohio.
- Hess Warming & Ventilating Co., Chicago.
- Holly Mfg. Co., Pasadena, Calif.
- Hopwood and Associates, Inc., J. W., Cleveland.
  Huwer Heating Corp., Milford, Mich.
  Independence Stove & Furnace Co., Independence, Mo.
  Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago.
  International Sales Co., San Francisco.
- Jackson & Church Co., Saginaw, Mich.
  Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
  Kaustine Company, Inc., Perry, N. Y.
- Kehm Corporation, Chicago, Ill.
  Keith Furnace Co., Des Moines, Ia.
  Kent & Co., Inc., J. King, St. Louis.
  Leeson Air Conditioning Corporation, Detroit.
  Lennox Furnace Co., Marshalltown, Ia.
  McDonald Mfg. Co., A. Y., Dubuque, Ia.
- Majestic Co., Huntington, Ind.
- May-Fiebeger Co., Newark, O.
- Mayflower Air Conditioners, Inc., St. Paul, Minn.
- Meyer Furnace Co., Peoria, Ill.
  Moncrief Furnace & Mfg. Co., Inc., Dallas, Texas.
- Morrison Steel Products, Inc., Buffalo.
- Mueller Furnace Co., L. J., Milwaukee.
- Naco Manufacturing Co., Huntington Park, Calif.
- Norge Heat Div., Borg-Warner Corporation, Detroit.
- Olsen Mfg. Co., C. A., Elyria, O.
  Pacific Gas Heating Co., San Francisco.
- Palmer Manufacturing Corp., Phoenix, Ariz.
- Patten Co., J. V., Sycamore, Ill.
  Payne Furnace Co., Beverly Hills, Calif.
- Peerless Foundry Co., Inc., Indianapolis, Ind.
  Pennsylvania Furnace & Iron Co., Warren, Pa.
- Perfection Stove Co., Cleveland.
  Pernot & Rich, Inc., Los Angeles.
- Premier Furnace Company, Dowagiac, Mich.
- Round Oak Co., Dowagiac, Mich.
- Royal Heaters, Inc., Alhambra, Calif.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
  St. Louis Furnace Manufacturing Co., St. Louis.
  Schill Mfg. Co., Crestline, O.
  Scott-Newcomb, Inc., St. Louis.
  Security Manufacturing Co., Kansas City, Mo.
  Sequoia Manufacturing Co., San Carlos, Calif.
  State Steel Products, Inc., Los Angeles, Calif.
  Sun-Fire Stoker Corporation, New Albany, Ind.
- Syncromatic Corporation, Watertown, Wis.
  U-Ni-Matic Heating Systems, Inc., Los Angeles.
  United States Radiator Corp., Detroit.
  Utility Appliance Corporation, Los Angeles. (Butane)
  Viking Mfg. Corp., Cleveland.
- Waterman-Waterbury Co., Minneapolis.
  Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
- Williamson Heater Co., Cincinnati.

Oil, Cast Iron

American Foundry & Furnace Co., Bloomington, Ill.
Coroaire Heater Corporation, Cleveland.
Excelsior Steel Furnace Co., Chicago.
- International Heater Co., Utica, N. Y.
  Keith Furnace Co., Des Moines, Ia.
  Kelsey Heating Co., Inc., Syracuse, N. Y.
  MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
  Montag Stove & Furnace Works, Portland, Ore.
  Mueller Furnace Co., L. J., Milwaukee.
  Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
  Schwab Furnace Co., Milwaukee.
  Sioux City Foundry & Boiler Co., Sioux City, Ia.
  Westwick & Son, Inc., John, Galena, Ill.
- Williams Oil-O-Matic Div., Eureka Williams Corporation, Bloomington, Ill.
- Wise Furnace Co., Akron, O.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

Oil, Steel

Airwasher Corporation, Eaton Rapids, Mich.
● Airtemp Div., Chrysler Corp., Dayton, O.
● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
American Stove Co., Lorain, O.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Auto-Heat Corporation, New York City.
Automatic Burner Corporation, Chicago.
Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Brenner & Co., Inc., Jacob, Fond du Lac, Wis.
Brown Steel Tank Co., Minneapolis.
Calesco Corporation, Lynn, Mass.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Cary Manufacturing Co., Waupaca, Wis.
● Century Engineering Corporation, Cedar Rapids, Ia.
● Certified Furnace Company, St. Paul, Minn.
Chandler Co., Cedar Rapids, Ia.
● Chicago Steel Furnace Co., Chicago.
● Cleveland Steel Products Corp., Toridheet Div., Cleveland.
● Conco Engineering Corp., Mendota, Ill.
Crane Company, Chicago.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Demuth & Sons, Charles, Minneola, L. I.
Deshler Foundry & Machine Works, Deshler, O.
● Des Moines Stove Repair Co., Des Moines, Ia.
● Dowagiac Steel Furnace Co., Dowagiac, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Eckhardt Manufacturing Company, Roselle, N. J.
Electrol Mfg. Co., Rutherford, N. J.
Farquhar Furnace Co., Wilmington, O.
● Fitzgibbons Boiler Co., Inc., New York City.
● Fluid Heat Division, Anchor Post Products, Inc., Baltimore.
Floral City Co., Monroe, Mich.
● Forest City Foundries Co., Cleveland, O.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
● Furbio Company, Hermansville, Mich.
General Bronze Corporation, Long Island City, N. J.
General Electric Co., Bloomfield, N. J.
General Corporation, Minneapolis.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Harvey-Whipple, Inc., Springfield, Mass.
Heatlox Furnaces, Inc., Tacoma, Wash.
● Heil Co., Milwaukee.
● Henry Furnace Co., Medina, O.
● Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater ,Mich.
Hotentot Co., Inc., Omaha, Nebr.
Huwer Heating Corp., Milford, Mich.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
● International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Iron Fireman Manufacturing Co., Cleveland.
● Jackson & Church Co., Saginaw, Mich.
Jennings, Freeland L., Lima, O. (With integral domestic water heating unit)
Johnson Co., S. T., Oakland, Calif., and Philadelphia.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Kaustine Company, Inc., Perry, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
Kleen-Heet, Inc., Chicago.
● Kresky Mfg. Co., Petaluma, Calif.
Laco Oil Burner Co., Griswold, Ia.
Leeson Air Conditioning Corp., Detroit.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C. San Rafael, Calif.
Lochinvar Products Div., Dearborn, Mich.
McPherson Furnace & Supply Co., Portland, Ore.
● Majestic Co., Huntington, Ind.
● May-Fiebeger Co., Newark, O.
● Mayflower Air Conditioners, Inc., St. Paul.
● Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
● Morrison Steel Products, Inc., Buffalo.
● Mueller Furnace Co., L. J., Milwaukee.
Nelson Company, Detroit.
● Norge Heat Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Co., Portland, Ore.
Nu-Way Corp., Rock Island, Ill.
● Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
● Patten Co., J. V., Sycamore, Ill.
● Peerless Foundry Co., Inc., Indianapolis, Ind.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
● Perfection Stove Co., Cleveland.
● Petroleum Heat & Power Co., Stamford, Conn.
Quaker Mfg. Co., Chicago.
Quincy Stove Manufacturing Co., Quincy, Ill.
Radiation Furnace Corp., Benton Harbor, Mich.
Ray Oil Burner Co., San Francisco.
Rosebraugh Co., W. W., Salem, Ore.
● Round Oak Co., Dowagiac, Mich.
● Rudy Furnace Co., Dowagiac, Mich.
● Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Scott-Newcomb, Inc., St. Louis.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Sundstrand Engineering Co., Rockford, Ill.
● Syncromatic Corporation, Watertown, Wis.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corp., Detroit.
Viking Mfg. Corp., Cleveland.
● Waterman-Waterbury Co., Minneapolis.
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Weatheral Engineers, Inc., Providence, R. I.
Western Blower Co., Seattle, Wash.
Westwick & Son. Inc., John, Galena, Ill.
● Williams Oil-O-Matic Div., Eureka Williams Corp., Bloomington, Ill.
● Williamson Heater Co., Cincinnati.
Wood Industries, Inc., Gar, Wayne, Mich.
York-Heat Div., York-Shipley, Inc., York, Pa.

Stoker, Cast Iron

(Especially Designed for Stoker Installation)

American Foundry & Furnace Co., Bloomington, Ill.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Stove & Mfg. Co., Quincy, Ill.
● Forest City Foundries Co., Cleveland, O.
● Front Rank Furnace Co., Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Keith Furnace Co., Des Moines, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Montag Stove & Furnace Works, Portland, Ore.
● Mueller Furnace Co., L. J., Milwaukee.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
● Williamson Heater Co., Cincinnati.

Stoker, Steel

(Especially Designed for Stoker Installation)

Airwasher Corporation, Eaton Rapids, Mich.
● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
Anchor Stove & Range Co., New Albany, Ind.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Foundry Co., Auburn, Ind.
● Automatic Firing Corporation, St. Louis.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
● Certified Furnace Company, St. Paul, Minn.
● Chicago Steel Furnace Co., Chicago.
● Conco Engineering Works, Mendota, Ill.
Deshler Foundry & Machine Works, Deshler, O.
● Dowagiac Steel Furnace Co., Dowagiac, Mich.
Farquhar Furnace Co., Wilmington, O.
● Fitzgibbons Boiler Co., Inc., New York City.
● Forest City Foundries Co., Cleveland, O.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
● Furbio Company, Hermansville, Mich.
Grossenbacher Furnace Co., Inc., St. Louis.
● Hall-Neal Furnace Co., Indianapolis, Ind.
Heatlox Furnaces, Inc., Tacoma, Wash.
● Hess Warming & Ventilating Co., Chicago.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Iron Fireman Manufacturing Co., Cleveland.
● Jackson & Church Co., Saginaw, Mich.
Keith Furnace Co., Des Moines, Ia.
Kol-Master Corporation, Oregon, Ill.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace & Supply Co., Portland, Ore.
● Majestic Company, Huntington, Ind.
● May-Fiebeger Co., Newark, O.
● Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Nelson Company, Detroit.
Northwest Foundry & Furnace Co., Portland, Ore.
● Olsen Mfg. Co., C. A., Elyria, O.
Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
● Premier Furnace Co., Dowagiac, Mich.
● Rheem Manufacturing Co., New York City.
Rosebraugh Co., W. W., Salem, Ore.
● Round Oak Co., Dowagiac, Mich.
● Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Sun-Fire Stoker Corporation, New Albany, Ind.

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

● Syncromatic Corporation, Watertown, Wis.
● Waterman-Waterbury Co., Minneapolis.
● Williamson Heater Co., Cincinnati.

Attic Type (Low-boy Unit)

● American Furnace Co., St. Louis. (Oil or gas)
International Sales Co., San Francisco. (Gas)
Lennox Furnace Co., Marshalltown, Iowa (Gas).
● Meyer Furnace Company, Peoria, Ill.
Payne Furnace Co., Beverly Hills, Calif. (Gas)

Utility Room, Coal, Cast Iron

● American Radiator & Standard Sanitary Corporation, Pittsburgh.
● Williamson Heater Co., Cincinnati.

Utility Room, Coal, Steel

● Airtemp Div., Chrysler Corp., Dayton, O.
● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
● Fitzgibbons Boiler Co., Inc., New York City.
Floral City Co., Monroe, Mich.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Jackson & Church Co., Saginaw, Mich.
● Kehm Corporation, Chicago.
Lennox Furnace Co., Marshalltown, Ia.
● Peerless Foundry Co., Inc., Indianapolis, Ind.
Smith Heater Co., Peter, Dearborn, Mich.
● Syncromatic Corporation, Watertown, Wis.

Utility Room, Gas, Cast Iron

● Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corporation, Pittsburgh.
Bastian-Morley Co., Inc., LaPorte, Ind.
● Bryant Heater Co., Cleveland.
● Forest City Foundries Co., Cleveland.
General Electric Co., Bloomfield, N. J.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Mueller Furnace Co., L. J., Milwaukee.
● Olsen Manufacturing Co., C. A., Elyria, O.
Richmond Radiator Co., New York City.
Security Manufacturing Co., Kansas City, Mo.
● Silver Flame, Inc., Detroit.
Surface Combustion, Toledo.
Vacuum Gas Appliances, Rome, N. Y.
Viking Mfg. Corp., Cleveland.
Wood Industries, Inc., Gar., Wayne, Mich.

Utility Room, Gas, Steel

Advance Furnace Co., Wichita, Kans.
● Airtemp Div., Chrysler Corporation, Dayton, O.
Aladdin Heating Corp., Oakland, Calif.
● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Company, Auburn, Ind.
Bard Manufacturing Co., Bryan, O.
● Bryant Heater Co., Cleveland.
● Coleman Company, Inc., Wichita, Kans.
● Conco Engineering Works, Mendota, Ill.
Dalzen Tool & Manufacturing Co., Detroit.
Farquhar Furnace Company, Wilmington, Ohio.
● Forest City Foundries Co., Cleveland.
Fraser & Johnston Co., San Francisco.
General Gas Light Co., Kalamazoo, Mich.
Green Colonial Furnace Co., Des Moines, Ia.
● Hall-Neal Furnace Co., Indianapolis, Ind.
Hammel Radiator Engineering Co., Los Angeles.
Heating Equipment Co., San Francisco.
Henderson Furnace & Mfg. Co., Sebastopol, Cal.
Huwer Heating Corp., Milford, Mich.
● Jackson & Church Co., Saginaw, Mich.
● Kehm Corporation, Chicago.
Kent & Co., Inc., J. King, St. Louis.
Leeson Air Conditioning Corporation, Detroit.
Lennox Furnace Co., Marshalltown, Ia.
● Majestic Co., Huntington, Ind.
● May-Fiebeger Company, Newark, O.
● Mayflower Air Conditioners, Inc., St. Paul, Minn.
● Meyer Furnace Co., Peoria, Ill.
● Morrison Steel Products, Inc., Buffalo, N. Y.
● Mueller Furnace Co., L. J., Milwaukee.
● Naco Manufacturing Co., Huntington Park, Calif.
● Norge Heat Div., Borg-Warner Corporation, Detroit.
Olsen Manufacturing Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
● Palmer Manufacturing Corp., Phoenix, Ariz.
● Patten Co., J. V., Sycamore, Ill.
Payne Furnace Co., Beverly Hills, Calif.
● Peerless Foundry Co., Inc., Indianapolis.
Pennsylvania Furnace & Iron Co., Warren, Pa.
● Perfection Stove Co., Cleveland.
● Rudy Furnace Co., Dowagiac, Mich.
Security Manufacturing Co., Kansas City, Mo.
Sequoia Manufacturing Co., San Carlos, Calif.
● Silver Flame, Inc., Detroit.
● Syncromatic Corporation, Watertown, Wis.
Viking Mfg. Corp., Cleveland.

Utility Room, Oil, Steel

● Airtemp Div., Chrysler Corporation, Dayton, O.
● American Furnace Co., St. Louis.
American Stove Co., Lorain Div., Lorain, O.
Auburn Burner Co., Auburn, Ind.
Bard Manufacturing Co., Bryan, O.
Cary Manufacturing Co., Waupaca, Wis.
● Coleman Company, Inc., Wichita, Kans.
● Dowagiac Steel Furnace Co., Dowagiac, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Farquhar Furnace Company, Wilmington, Ohio.
● Fluid Heat Division, Anchor Post Products, Inc., Baltimore.
General Electric Co., Bloomfield, N. J.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Harvey-Whipple, Inc., Springfield, Mass.
Huwer Heating Corp., Milford, Mich.
● Jackson & Church Co., Saginaw, Mich.
● Kresky Mfg. Co., Petaluma, Calif.
Leeson Air Conditioning Corp., Detroit.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
McPherson Furnace & Supply Co., Portland, Ore.
● Majestic Co., Huntington, Ind.
● May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
● Morrison Steel Products, Inc., Buffalo.
● Mueller Furnace Co., L. J., Milwaukee.
● Norge Heat Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Co., Portland, Ore.
● Patten Co., J. V., Sycamore, Ill.
● Peerless Foundry Co., Inc., Indianapolis, Ind.
● Perfection Stove Co., Cleveland.
● Premier Furnace Co., Dowagiac, Mich.
Quaker Mfg. Co., Chicago.
Quincy Stove Manufacturing Co., Quincy, Ill.
Sandberg Co., H. J., Portland, Ore.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Smith Heater Co., Peter, Dearborn, Mich.
● Syncromatic Corporation, Watertown, Wis.
Viking Manufacturing Corp., Cleveland.
Weatherall Engineers, Inc., Providence, R. I.
Wood Industries, Inc., Gar., Wayne, Mich.
York-Heat Div., York-Shipley, Inc., York, Pa.

FURNACES, WARM AIR, GRAVITY

Coal, Cast Iron

Agricola Furnace Co., Inc., Gadsden, Ala.
● Airtemp Div., Chrysler Corporation, Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
● American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
Barry Furnace Co., Hamilton, O.
Bergstrom Mfg. Co., Neenah, Wis.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Crane Company, Chicago.
● Des Moines Stove Repair Co., Des Moines, Ia.
● Dowagiac Steel Furnace Co., Dowagiac, Mich.
Edwards Furnace Co., Wellsboro, Pa.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Co., Springfield, Ill.
Favorite Stove Co., Piqua, O.
● Forest City Foundries Co., Cleveland.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
● Hall-Neal Furnace Co., Indianapolis, Ind.
Hare Engineering Co., Detroit.
Hart & Crouse Corporation, Utica, N. Y.
Hart Furnace and Supply Co., Louisville, Ky.
● Henry Furnace Co., Medina, O.
Hess-Snyder Co., Massillon, O.
Home Furnace Co., Holland, Mich.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Independence Stove & Furnace Co., Independence, Mo.
● International Heater Co., Utica, N. Y.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Katelman Foundry & Mfg. Co., Council Bluffs, Iowa.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
● Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
● May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
● Mueller Furnace Co., L. J., Milwaukee, Wis.
● Olsen Mfg. Co., C. A., Elyria, O.
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
● Premier Furnace Co., Dowagiac, Mich.
● Round Oak Co., Dowagiac, Mich.

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- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Clair Foundry Corp., Centralia, Ill.
- Schill Mfg. Co., Crestline, O.
- Schwab Furnace Co., Milwaukee, Wis.
- Sioux City Foundry and Boiler Co., Sioux City, Ia.
- Spear Stove and Heater Co., James, Philadelphia.
- Thatcher Furnace Co., Garwood, N. J.
- Union Manufacturing Co., Inc., Boyertown, Pa.
- United States Radiator Corp., Detroit, Mich.
- Western Furnaces, Inc., Tacoma, Wash.
- Westwick & Son, Inc., John, Galena, Ill.
- Williamson Heater Co., Cincinnati.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

Coal, Steel

- Airtemp Div., Chrysler Corporation, Dayton, O.
- American Furnace Co., St. Louis, Mo.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Andrews Heating Co., Minneapolis.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.
- Bard Manufacturing Co., Bryan, O.
- Berger Furnace Mfg. Co., Pittsburgh.
- Bovee Furnace Works, Waterloo, Ia.
- Campbell Heating Co., Des Moines, Ia.
- Certified Furnace Company, St. Paul, Minn.
- Chicago Heat-Master Co., Chicago.
- Conco Engineering Works, Mendota, Ill.
- Daniels Mfg. Co., Inc., Sam., Hardwick, Vt.
- Deshler Foundry & Mach. Wks., Deshler, O.
- Des Moines Stove Repair Co., Des Moines, Ia.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Farquhar Furnace Co., Wilmington, O.
- Floral City Co., Monroe, Mich.
- Forest City Foundries Co., Cleveland, O.
- Friendly Furnace & Foundry Co., Sioux City, Ia.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Green Colonial Furnace Co., Des Moines, Ia.
- Grossenbacher Furnace Co., St. Louis, Mo.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hart Furnace and Supply Co., Louisville, Ky.
- Henry Furnace Company, Medina, O.
- Hess-Snyder Co., Massillon, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- Home Stove Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- International Heater Co., Utica, N. Y.
- Jackson & Church Co., Saginaw, Mich.
- Joliet Heating Corp., Joliet, Ill.
- Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
- Keith Furnace Co., Des Moines, Ia.
- Lennox Furnace Co., Marshalltown, Ia.
- McPherson Furnace & Supply Co., Portland, Ore.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Majestic Co., Huntington, Ind.
- Marshall Furnace Co., Marshall, Mich.
- May-Fiebeger Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norge Heat Div., Borg-Warner Corporation, Detroit.
- Northwest Foundry & Furnace Co., Portland, Ore.
- Nugent Furnaces, Thos., New York City.
- Olsen Mfg. Co., C. A., Elyria, O.
- Peerless Foundry Co., Indianapolis, Ind.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Louis Furnace Mfg. Co., St. Louis.
- Sandberg Co., H. J., Portland, Ore.
- Schill Mfg. Co., Crestline, O.
- Sioux City Foundry and Boiler Co., Sioux City, Ia.
- Syncromatic Corporation, Watertown, Wis.
- Thatcher Furnace Company, Garwood, N. J.
- Tri-State Heating Supply Co., Fort Wayne, Ind.
- United States Radiator Corp., Detroit.
- Viking Mfg. Co., Cleveland.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Westwick & Son, Inc., John, Galena, Ill.
- Wheeling Furnace Corporation, Martins Ferry, O. (Steel Open Dome)
- Williamson Heater Co., Cincinnati.
- Worsham Company, Incorporated, St. Louis.

Gas, Cast Iron

- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- Bryant Heater Co., Cleveland.
- Favorite Stove Co., Piqua, O.
- Forest City Foundries Co., Cleveland, O.
- Henry Furnace Company, Medina, O.
- Hess-Snyder Co., Massillon, O.
- Kelsey Heating Co., Syracuse, N. Y.
- Marshall Furnace Co., Marshall, Mich.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Olsen Manufacturing Co., C. A., Elyria, O.
- Richmond Radiator Co., New York City.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Company, Ashland, O.
- Silver Flame, Inc., Detroit.
- Sioux City Foundry & Boiler Co., Sioux City, Ia.
- Surface Combustion, Toledo, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

Gas, Steel

- Advance Furnace Co., Wichita, Kansas.
- Airtemp Div., Chrysler Corporation, Dayton, O.
- Aladdin Heating Corp., Oakland, Calif.
- American Furnace Co., St. Louis, Mo.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Andrews Heating Co., Minneapolis.
- Andrews-Schroeder Heating Co., Inc., Glendale, Calif.
- Armstrong Furnace Co., Columbus, O.
- Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.
- Bard Manufacturing Company, Bryan, Ohio.
- Beck Engineering Combustion Kompany, St. Louis.
- Berger Furnace Mfg. Co., Pittsburgh.
- Brown Steel Tank Co., Minneapolis.
- Bryant Heater Co., Cleveland.
- Campbell Heating Co., Des Moines, Ia.
- Century Engineering Corporation, Cedar Rapids, Ia.
- Coleman Co., Inc., Wichita, Kans.
- Conco Engineering Works, Mendota, Ill.
- Dalzen Tool & Manufacturing Co., Detroit.
- Dornback Furnace & Foundry Co., Cleveland.
- Farquhar Furnace Co., Wilmington, Ohio.
- Forest City Foundries Co., Cleveland, O.
- Fraser Furnace Co., Inc., Stockton, Calif.
- Fraser and Johnston Co., San Francisco.
- Green Colonial Furnace Co., Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hammel Radiator Engineering Co., Los Angeles.
- Heating Equipment Co., San Francisco.
- Henry Furnace Company, Medina, O.
- Holly Manufacturing Co., Pasadena, Calif.
- Hopwood and Associates, Inc., J. W., Cleveland.
- Hotentot Company, Inc., Omaha, Nebr.
- Independence Stove & Furnace Co., Independence, Mo.
- International Sales Co., San Francisco.
- Jackson & Church Co., Saginaw, Mich.
- Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
- Lennox Furnace Co., Marshalltown, Ia.
- May-Fiebeger Co., Newark, O.
- Mayflower Air Conditioners, Inc., St. Paul, Minn.
- Meyer Furnace Co., Peoria, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Naco Manufacturing Co., Huntington Park, Calif.
- Norge Heat Div., Borg-Warner Corporation, Detroit.
- Nugent Furnaces, Thomas, New York City.
- Olsen Mfg. Co., C. A., Elyria, O.
- Pacific Gas Heating Company, San Francisco.
- Payne Furnace Co., Beverly Hills, Calif.
- Peerless Foundry Co., Inc., Indianapolis, Ind.
- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Perfection Stove Co., Cleveland.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Louis Furnace Mfg. Co., St. Louis.
- Schill Mfg. Co., Crestline, Ohio.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Security Manufacturing Co., Kansas City, Mo.
- Sequoia Manufacturing Co., San Carlos, Calif.
- Stewart Co., W. H., Oklahoma City, Okla.
- Syncromatic Corporation, Watertown, Wis.
- United States Radiator Corp., Detroit.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Williamson Heater Co., Cincinnati.

Oil, Cast Iron

- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace & Foundry Co., Milan, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Hart & Crouse Corporation, Utica, N. Y.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Marshall Furnace Co., Marshall, Mich.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee.
- Sioux City Foundry & Boiler Co., Sioux City, Ia.
- Wise Furnace Company, Akron, O.

Oil, Steel

- Airtemp Division, Chrysler Corp., Dayton, O.
- Airwasher Corporation, Eaton Rapids, Mich.
- American Furnace Co., St. Louis.
- American Radiator & Standard Sanitary Corp., Pittsburgh.
- Andrews Heating Co., Minneapolis.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Avery Farm Machinery Co., Hart Burner Dept., Peoria, Ill.

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

Bard Manufacturing Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Brown Steel Tank Co., Minneapolis.
Campbell Heating Co., Des Moines, Ia.
Cary Mfg. Co., Waupaca, Wis.
● Certified Furnace Company, St. Paul, Minn.
● Coleman Co., Inc., The, Wichita, Kans.
● Conco Engineering Works, Mendota, Ill.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Evans Products Co., Heating & Appliance Div., Plymouth, Mich.
Farquhar Furnace Co., Wilmington, O.
● Forest City Foundries Co., Cleveland.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Green Colonial Furnace Co., Des Moines, Ia.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Henry Furnace Co., Medina, O.
● Hess Warming & Ventilating Co., Chicago.
Hotentot Co., Inc., Omaha, Nebr.
Keith Furnace Co., Des Moines, Ia.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
● May-Fiebeger Co., Newark, O.
● Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
● Mueller Furnace Co., L. J., Milwaukee.
● Norge Heat Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Co., Portland, Ore.
Nugent Furnaces, Thomas, New York City.
● Olsen Mfg. Co., C. A., Elyria, O.
● Peerless Foundry Co., Indianapolis.
Perfection Stove Co., Cleveland.
Portland Stove Foundry Co., Portland, Me.
● Premier Furnace Co., Dowagiac, Mich.
Quaker Manufacturing Co., Chicago.
Quincy Stove Manufacturing Co., Quincy, Ill.
Rosebraugh Co., W. W., Salem, Ore.
● Round Oak Co., Dowagiac, Mich.
● Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Scott-Newcomb, Inc., St. Louis.
● Syncromatic Corporation, Watertown, Wis.
● Thatcher Furnace Co., Garwood, N. J.
United States Radiator Corp., Detroit.
Viking Mfg. Corp., Cleveland.
● Waterman-Waterbury Co., Minneapolis.
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Western Blower Co., Seattle, Wash.
● Williams Oil-O-Matic Div., Eureka Williams Corporation, Bloomington, Ill.
● Williamson Heater Co., Cincinnati.

Stoker, Cast Iron

Anchor Stove & Range Co., New Albany, Ind.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Stove & Mfg. Co., Quincy, Ill.
● Forest City Foundries Co., Cleveland.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
● Hall-Neal Furnace Co., Indianapolis, Ind.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
● Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
Montag Stove & Furnace Works, Portland, Ore.
● Mueller Furnace Co., L. J., Milwaukee. (Double radiator)
● Premier Furnace Co., Dowagiac, Mich.
Sioux City Fdy. & Boiler Co., Sioux City, Ia.

Stoker, Steel

● American Furnace Co., St. Louis.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
● Automatic Firing Corporation, St. Louis.
Beck Engineering Combustion Kompany, St. Louis.
Campbell Heating Co., Des Moines, Ia.
● Certified Furnace Company, St. Paul, Minn.
● Conco Engineering Works, Mendota, Ill.
Floral City Co., Monroe, Mich.
● Forest City Foundries Co., Niagara Furnace Div., Cleveland.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
● Hall-Neal Furnace Co., Indianapolis, Ind.
● Henry Furnace Co., Medina, O.
● Hess Warming & Ventilating Co., Chicago.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Keith Furnace Co., Des Moines, Ia.
Lennox Furnace Co., Marshalltown, Ia.
● Majestic Co., Huntington, Ind.
● May-Fiebeger Co., Newark, O.
● Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
● Mueller Furnace Co., L. J., Milwaukee, Wis.
Northwest Stove & Furnace Co., Portland, Ore.
● Olsen Mfg. Co., C. A., Elyria, O.
● Premier Furnace Co., Dowagiac, Mich.
● Rheem Manufacturing Co., New York City.
● Round Oak Co., Dowagiac, Mich.
● Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sun-Fire Stoker Corporation, New Albany, Ind.
● Syncromatic Corporation, Watertown, Wis.
Viking Manufacturing Corp., Cleveland.
● Waterman-Waterbury Co., Minneapolis.
● Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, WOOD BURNING, CAST IRON

● Certified Furnace Company, St. Paul, Minn.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Hart & Crouse Corporation, Utica, N. Y.
Homer Furnace & Foundry Corp., Coldwater, Mich.
● International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
● Majestic Co., Huntington, Ind.
Moncreif Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.
Portland Stove Foundry Co., Portland, Me.
Schwab Furnace Co., Milwaukee.
Western Furnaces, Inc., Tacoma, Wash.

FURNACES, WARM AIR, WOOD BURNING, STEEL

Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
● Certified Furnace Company, St. Paul, Minn.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
● Hess Warming & Ventilating Co., Chicago.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace & Supply Co., Portland, Ore. (Also Sawdust)
● Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.
Northwest Foundry & Furnace Co., Portland, Ore.
Nugent Furnaces, Thomas, New York City.
Rosebraugh Co., W. W., Salem, Ore.
Sandberg Co., H. J., Portland, Ore.
● Syncromatic Corporation, Watertown, Wis.

GAS BURNERS

See Burners, Gas

GAGES, INDICATING, DRAFT, PORTABLE

● Bacharach Industrial Instrument Co., Pittsburgh.
Bristol Company, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis.
Detroit Air Conditioning Service Co., Inc., Detroit.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Foxboro Co., Foxboro, Mass.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., The, Cleveland.
Meriam Co., Cleveland.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Uehling Instrument Co., Paterson, N. J.

GATES, BLAST

See Blast Gates

GLASS, WIRE, FOR SKYLIGHTS

Atcheson Glass Co., T. J., Buffalo.
Bache & Co., Semon, New York City.
Libbey-Owens-Ford Glass Co., Toledo, O.
Pennsylvania Wire Glass Co., Philadelphia (corrugated wire)
Pittsburgh Plate Glass Co., Pittsburgh.
Richards, J. Merrill, Boston.
Robertson Co., H. H., Pittsburgh.

GLAZING COMPOUNDS

See Compounds, Glazing

GRILLES, HEATING AND VENTILATING

See Faces and Registers

GRILLES, VENTILATING SYSTEM (METAL)

● A-J Manufacturing Co., Kansas City, Mo.
Acme Wire & Iron Works, Detroit.
● Air Control Products, Inc., Coopersville, Mich.
● Auer Register Co., Cleveland.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Best Register Co., Milwaukee, Wis.
Diamond Manufacturing Co., Wyoming, Pa.
Erdle Perforating Company, Rochester, N. Y.
● Harrington & King Perforating Co., Chicago.
Harrison Radiator Cover Company, Chicago.
● Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Manufacturing Co., Carbondale, Pa.
● Independent Register Co., Cleveland, O.
Midco Register Corporation, St. Paul.
Mundt & Sons, Charles, Jersey City, N. J.
Newman Brothers, Inc., Cincinnati.
Register & Grille Manufacturing Co., Inc., Brooklyn.
● Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia.
● Stewart Manufacturing Co., Bloomfield, N. J.
● Tuttle & Bailey, Inc., New Britain, Conn.
● United States Air Conditioning Corp., Minneapolis.
United States Register Co., Battle Creek, Mich.
● Waterloo Register Co., Waterloo, Ia.

GRINDERS, BUFFERS, POLISHERS AND SANDERS

See Buffers, Grinders, Polishers and Sanders

GROOVING MACHINES

See Machines, Grooving

GUARDS, SNOW

● Berger Brothers Co., Philadelphia.
Barnard Co., Geo. A., Worcester, Mass.
Cartier & Sons Co., M. N., Providence, R. I.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Danzer Metal Works Co., Hagerstown, Md. (All types).
Downs-Smith Brass & Copper Co., New York City.
Folsom Snow Guard Co., Millis, Mass.
Hamblin & Russell Mfg. Co., Inc., Worcester, Mass.
● Hussey & Co., C. G., Pittsburgh. (Copper)
● Levow, David, New York City.
Maysteel Products, Inc., Milwaukee.
Obdyke, Inc., B. P., Philadelphia.
Royal-Apex Mfg. Corp., Brooklyn. (Cast Iron)

GUNS, SPRAY, METALS

Schori Process, Div. Ferro-Co Corp., Long Island City, N. Y.
Turner Brass Works, Sycamore, Ill.

GUNS, SPRAY, PAINT

Aeroil Products Co., West New York, N. J.
Binks Mfg. Co., Chicago.
Black Manufacturing Co., Baltimore.
DeVilbiss Co., Toledo, O.
Dustless Painting Machine Corp., New Britain, Conn.
Electric Sprayit Co., Sheboygan, Wis.
Plummer Spray Equipment Co., Napoleon, Ohio.
Spray Engineering Co., Somerville, Mass.

GUTTER FORMERS

See Machines, Gutter Forming

GUTTERS

See Eaves Trough and Gutters

HAMMERS, ELECTRIC OR PNEUMATIC

● Black & Decker Mfg. Co., Towson, Md.
Borm Manufacturing Co., Elgin, Ill. (Pneumatic)
Brown-Appton Co., New York City. (Pneumatic).
Buckeye Tools Corp., Dayton, O. (Pneumatic riveter)
Chicago Pneumatic Tool Co., New York City. (Pneumatic).
Coast Pneumatic Tool Co., Los Angeles. (Pneumatic).
Ideal Industries, Inc., Sycamore, Ill. (Pneumatic)
Independent Pneumatic Tool Co., Chicago. (Electric, Pneumatic)
Keller Tool Company, Grand Haven, Mich. (Pneumatic).
Millers Falls Co., Greenfield, Mass. (Electric)
Phillips Drill Co., Chicago. (Electric)
Stanley Electric Tool Div., Stanley Works, New Britain, Conn. (Electric)
Superior Manufacturing Co., Cleveland. (Pneumatic)
Syntron Company, Homer City, Pa. (Electric)
Van Dorn Electric Tool Co., Towson, Md. (Electric)
● Wodack Electric Tool Corp., Chicago. (Electric).
Yoder Co., Cleveland.

HANGERS

See Fittings and Accessories, Eaves Trough and Gutter

HARDWARE, FOR CABINETS AND CASINGS

(Handles, name plates, etc.)

American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, Hinges, Catches, etc.)
American Insulator Corporation, New Freedom, Pa.
Corbin Div., P. & F., New Britain, Conn. (Handles, catches, locks, hinges)
Etched Products Co., Long Island City, N. Y. (Name Plates)
Grammes, L. F., & Sons, Inc., Allentown, Pa.
Greenberg's Sons, M., San Francisco. (Name plates, letters, hinges, bolts, latches)
Hartwell Engineering Co., Los Angeles. (Flush latches, hinges)
Meyers Mfg. Co., Fred L., Hamilton, O. (Nameplates)
Moss Industries, Inc., Brooklyn, N. Y.
National Lock Co., Rockford, Ill.
Premier Metal Etching Co., Long Island City. (Name Plates)
Soss Manufacturing Co., Detroit. (Invisible Hinges)

HEADS

See Fittings and Accessories, Conductor

HEAT TRANSFER SURFACE

See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling Water

HEATERS, DIRECT FIRED

See Furnaces

HEATERS, SCHOOL ROOM

Agricola Furnace Co., Inc., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
● American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Barry Furnace Co., Hamilton, O.
Campbell Heating Co., Des Moines, Ia.
Chandler Co., Cedar Rapids, Ia.
● Chicago Steel Furnace Co., Chicago. (Gas or Oil)
Daniels Mfg. Co., Inc., Sam, Hardwick, Vermont. (Wood)
● Dowagiac Steel Furnace Co., Dowagiac, Mich.
Dravo Corporation, Pittsburgh.
Excelsior Stove & Mfg. Co., Quincy, Ill.
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
Hart & Crouse Corporation, Utica, N. Y.
Heating Equipment Co., San Francisco. (Gas)
● Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, Ohio.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
● International Heater Co., Utica, N. Y.
● Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
● May-Fiebeger Co., Newark, Ohio.
● Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
● Mueller Furnace Co., L. J., Milwaukee, Wis.
Nelson Corporation, Herman, Moline, Ill.
● Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas)
Payne Furnace Co., Beverly Hills, Calif.
● Perfection Stove Co., Cleveland. (Oil)
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
● Premier Furnace Co., Dowagiac, Mich.
● Round Oak Co., Dowagiac, Mich.
St. Clair Foundry Corp., Centralia, Ill.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
● Syncromatic Corporation, Watertown, Wis.
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)

Western Blower Co., Seattle, Wash.
● Williamson Heater Co., Cincinnati.
● Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

HEATERS, SPACE, CABINET TYPE

Acme Tin Plate & Roofing Supply Co., Philadelphia. (Electric)
Adams Bros. Mfg. Co., Inc., Pittsburgh.
Agricola Furnace Co., Inc., Gadsden, Ala. (Coal)
Allen Manufacturing Co., Inc., Nashville, Tenn.
American Gas Machine Company, Albert Lea, Minn. (Oil)
American Stove Co., Lorain Div., Lorain, O. (Oil)
Andrews Heating Co., Minneapolis. (Coal and Oil)
Armstrong Products Corporation, Huntington, W. Va.
Auburn Burner Co., Auburn, Ind. (Oil)
Bern's Specialty Mfg. Co., Chicago. (Steam)
Cole Hot Blast Mfg. Co., Chicago. (Coal, Oil, Gas, Wood)
● Coleman Company, Inc., Wichita, Kans.
Coroaire Heater Corporation, Cleveland. (Gas, Oil).
Day & Night Manufacturing Co., Monrovia, Calif. (Gas)
Dearborn-Monroe Co., Chicago. (Gas)
Dearborn Stove Co., Dallas, Texas. (Gas)
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich. (Oil)
Edwards Mfg. Co., Inc., Cincinnati. (Coal, Coke, Wood)
Empire Stove Co., Belleville, Ill. (Gas)
Enterprise Foundry Co., Belleville, Ill. (Coal and Wood)
Estate Stove Co., Hamilton, O. (Coal, Oil, Gas)
Evans Products Co., Heating & Appliance Div., Plymouth, Mich. (Oil)
Excelsior Stove & Mfg. Co., Quincy, Ill.
Florence Stove Co., Gardner, Mass. (Oil)
Gas-Con Equipment Co., Waco, Tex. (Gas)
General Gas Light Co., Kalamazoo, Mich. (Gas)
Hammel Radiator Engineering Co., Los Angeles. (Gas)
Heating Equipment Co., San Francisco. (Gas)
Hot-Boy, Inc., Cleveland. (Gas)
● Hopwood and Associates, Inc., J. W., Cleveland. (Gas)
Hot Boy, Inc., Cleveland.
Independence Stove & Furnace Co., Independence, Mo. (Gas or Coal)
Jackes-Evans Mfg. Co., St. Louis.
● Kehm Corporation, Chicago. (Gas, Oil and Coal)
● Kresky Mfg. Co., Petaluma, Calif. (Oil)
Laco Oil Burner Co., Griswold, Ia. (Oil)
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
Lonergan Manufacturing Co., Albion, Mich. (Oil)
Martin Stamping & Stove Co., Huntsville, Ala.
● Naco Manufacturing Co., Huntington Park, Calif. (Gas)
Oakland Foundry Co., Belleville, Ill.
● Palmer Manufacturing Corp., Phoenix, Ariz.
● Patten Co., J. V., Sycamore, Ill. (Coal, oil and gas)
Payne Furnace Co., Beverly Hills, Calif.
Peerless Manufacturing Corporation, Louisville, Ky.
● Perfection Stove Co., Cleveland. (Oil)
Pernot & Rich, Inc., Los Angeles. (Gas)
Pittston Stove Co., Pittston, Pa. (Coal or Wood)
Premier Stove Co., Belleville, Ill. (Gas)
Quad Stove Mfg. Co., Columbus, Ohio. (Gas)
Quaker Mfg. Co., Chicago. (Oil)
Quincy Stove Mfg. Co., Quincy, Ill. (Oil and Coal)
Reznor Mfg. Co., Mercer, Pa. (Gas)
● Rheem Manufacturing Co., New York City. (Gas, Oil)
Samuel Stamping & Enameling Co., Chattanooga, Tenn. (Gas)
Schoedinger, F. O., Columbus, O.
Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil)
Southern Aircraft Co., Garland, Dallas Co., Tex. (Gas)
Sunshine Mantle Co., Chanute, Kansas. (Gas)
Surface Combustion, Toledo, O. (Gas)
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
United States Stove Company, South Pittsburg, Tenn.
Utility Appliance Corporation, Los Angeles. (Gas, Butane)
Vacuum Gas Appliances, Rome, N. Y. (Gas)
Victor Oil Burner Mfg. Co., Hartford, Conn.
Viking Mfg. Corp., Cleveland. (Oil)
Washington Stove Works, Everett, Wash. (Wood)
● Williams Radiator Company, Los Angeles.

HEATERS, DIRECT FIRED

See Furnaces

HEATERS, WATER, STORAGE TYPE

Electric

Bastian-Morley Co., Inc., La Porte, Ind.
● Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Cleveland Heater Co., Cleveland.
McGraw Electric Co., Chicago.
Red Spot Electric Co., Tacoma, Wash.
● Rheem Manufacturing Co., New York City.
Smith Corporation, A. O., Milwaukee.
Thermandor Electrical Mfg. Co., Inc., Los Angeles.
Tru-Mac Mfg. Co., Reading, Mass.
Waldorf Heater Company, Philadelphia.
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Wood Mfg. Co., Inc., John, Conshohocken, Pa.

Gas-Fired

Amazon Heater Co., Cleveland.
American Gas Machine Co., Albert Lea, Minn.
● American Radiator & Standard Sanitary Corp., Pittsburgh.
Autogas Co., Chicago.
Bastian Manufacturing Co., W. B., Los Angeles
Bastian-Morley Co., Inc., LaPorte, Ind.
Brown Steel Tank Co., Minneapolis.
● Bryant Heater Co., Cleveland.
Buckeye Water Heater Co., Cleveland.
● Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Coast Water Heater Co., Los Angeles.
● Coleman Co., Inc., Wichita, Kans. (and L. P. gas)
Combustion Engineering Co., Inc., Chattanooga, Tenn.
Continental Water Heater Co., Ltd., Los Angeles.
Crane Company, Chicago.
Cronk Company, Dallas, Tex.
Crown Heater Co., Compton, Calif.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Dalco Appliance Co., San Francisco.
Dary Company, W. M., Long Beach, Calif.
Day & Night Manufacturing Co., Monrovia, Calif.
Domestic Gas Equipment Co., San Francisco.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
EverHot Heater Co., Detroit.
Eveready Supply Co., Dallas, Tex.
FauceHot Heater Co., La Porte, Ind.
Federal Water Heater Co., Inc., Burbank, Calif.
General Water Heater Corp., Burbank, Calif.
Graham Hambly Co., Los Angeles.
Hambler Boiler & Tank Co., Chicago.
Handley Brown Heater Co., Jackson, Mich.
Hollywood Water Heater Co., Glendale, Calif.
Hotstream Heater Co., Cleveland.
Hoyt Heater Co., Los Angeles.
Koil-Les Heater Co., Geneva, Ill.
Lawson Manufacturing Co., Pittsburgh.
Los Angeles Gas Appliance Co., Inc., Los Angeles.
Lovekin Water Heater Co., Philadelphia.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Merit Water Heater Co., Compton, Calif.
Mustee Heater Co., Cleveland.
● Naco Manufacturing Co., Huntington Park, Calif.
Norman Products Company, Inc., Columbus, O.
Pennsylvania Range Boiler Co., Philadelphia.
Perfection Water Heater Co., Glendale, Calif.
Pioneer Water Heater Co., Los Angles.
Pittsburgh Water Heater Co., Pittsburgh.
Republic Heater Corporation, Huntington Park, Calif.
● Rheem Manufacturing Co., New York City.
Ruud Manufacturing Co., Pittsburgh.
Schoedinger, F. O., Columbus, Ohio.
Security Manufacturing Co., Kansas City, Mo.
Smith Corporation, A. O., Milwaukee.
Sunbeau Heater Company, Los Angeles.
Sunshine Mantle Co., Chanute, Kans.
SuperbO Mfg. Co., Los Angeles.
Waldorf Heater Company, Philadelphia.
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Wood Mfg. Co., Inc., John, Conshohocken, Pa.

Oil-Fired

● Air Devices, Inc., New York.
● Airtemp Division, Chrysler Corp., Dayton, O.
Aldrich Company, Wyoming, Ill.
Allen Manufacturing Co., Inc., Nashville, Tenn.
American Gas Machine Company, Albert Lea, Minn.
Auburn Burner Company, Auburn, Ind.
Automatic Burner Corporation, Chicago.
Burnham Boiler Corporation, Irvington-on-the-Hudson, N. Y.
Calesco Corporation, Lynn, Mass.
● Century Engineering Corporation, Cedar Rapids, Iowa.
● Clayton & Lambert Mfg. Co., Louisville, Ky.
● Cleveland Steel Products Corp., Toridheet Div., Cleveland.
● Coleman Company, Inc., Wichita, Kans.
● Conco Engineering Works, Mendota, Ill.
Crown Heater Co., Compton, Calif.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Electrol Mfg. Co., Rutherford, N. J.
Evans Products Co., Plymouth, Mich.
Florence Stove Co., Gardner, Mass.
Gerstein & Cooper Co., South Boston, Mass.
● Gillen Company, J. L., Dowagiac, Mich.
Gilmore & Co., Jackson G., Cleveland.
Hotstream Heater Co., Cleveland.
Jennings, Freeland L., Lima, O. (Oil burner with integral domestic water heating unit)
Johnson Co., S. T., Oakland, Cal.
Kleen-Heet, Inc., Chicago.
● Kresky Mfg. Co., Petaluma, Calif.
Kresno Stamm Co., New York City.
Little Burner Co., Inc., H. C., San Rafael, Cal.
Lochinvar Products Div., Dearborn, Mich.

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Lonergan Manufacturing Co., Albion, Mich.
Merit Water Heater Co., Compton, Calif.
• Norge Heat Div., Borg-Warner Corporation, Detroit.
Nu-Way Corp., Rock Island, Ill.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
• Perfection Stove Co., Inc., Cleveland.
• Petroleum Heat & Power Co., Stamford, Conn.
Preferred Utilities Mfg. Corp., New York City.
Quaker Manufacturing Co., Chicago.
Quincy Stove Mfg. Co., Quincy, Ill.
Ray Oil Burner Company, San Francisco.
• Rheem Manufacturing Co., New York City.
Scott-Newcomb, Inc., St. Louis.
Sunbeau Heater Company, Los Angeles.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
Toledo Heater Company, Toledo, Ohio.
United States Radiator Corporation, Detroit.
Viking Mfg. Corp., Cleveland.
Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
• Williams Oil-O-Matic Div., Eureka Williams Corporation, Bloomington, Ill.
York-Heat Div., York-Shipley, Inc., York, Pa.

Stoker-Fired

Catskill Metal Works, Inc., Catskill, N. Y.
• Gehl Bros. Mfg. Co., West Bend, Wis.

HEATING COILS

See Coils, Heating

HOISTS, HAND AND POWER

American Engineering Co., Philadelphia.
American MonoRail Co., Cleveland (Electric)
Chester Mfg. Co., Lisbon, Ohio.
Chicago Pneumatic Tool Co., New York City. (Power)
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
• Conco Engineering Works, Mendota, Ill.
Detroit Hoist & Machine Co., Detroit.
Electro Life, Inc., New York City.
Euclid Crane & Hoist Co., Euclid, Ohio.
Ford Chain Block Div., American Chain & Cable Co., Inc., Philadelphia.
Harnischfeger Corporation, Milwaukee.
Harrington Co., Philadelphia.
Industrial Brownhoist Corporation, Bay City, Mich.
Lisbon Hoist & Crane Co., Lisbon, Ohio. (Electric)
Louden Company, Fairfield, Iowa.
McCollum Hoist & Mfg. Co., Downers Grove, Ill.
Master Electric Co., Dayton, Ohio.
Philadelphia Chain Block & Mfg. Co., Inc., Philadelphia.
Reading Chain & Block Corporation, Reading, Pa.
Richards-Wilcox Manufacturing Co., Aurora, Ill.
Robbins & Myers, Inc., Springfield, Ohio.
Shepard Niles Crane & Hoist Corporation, Montour Falls, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Union Mfg. Co., New Britain, Conn.
Wright Manufacturing Division, American Chain & Cable Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Philadelphia.

HOODS, DRAFT, GAS

See Draft Diverters for Gas Heaters

HOSE AND FITTINGS, METAL FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., Waterbury, Conn.
American Ventilating Hose Co., New York City.
Brockway Co., Naugatuck, Conn.
Chicago Metal Hose Corporation, Maywood, Ill.
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Everhot Products Co., Chicago, Ill.
Packless Metal Products Corp., New Rochelle, N. Y.
Penflex Sales Div. Pennsylvania Flexible Metallic Tubing Co., Philadelphia.
Seamlex Co., Long Island City, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.

HOUSINGS, BLOWER

• Air Controls, Inc., Cleveland.
• Brundage Co., Kalamazoo, Mich.
• Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, Ohio.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Stamping Co., Detroit.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago.
Northern Blower Co., Cleveland.
Sandberg Co., H. J., Portland, Ore.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Torrington Mfg. Co., Torrington, Conn.
• Trade-Wind Motorfans, Inc., Los Angeles.
• U. S. Air Conditioning Corp., Minneapolis.
Utica Products, Incorporated, Utica, N. Y.
• Viking Air Conditioning Corp., Cleveland.

HOUSINGS, FAN, PROPELLER

Circulators & Devices Mfg. Corp., New York.
Commercial Shearing & Stamping Co., Youngstown, Ohio (Venturi type)
Dahlstrom Metallic Door Co., Jamestown, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Martin Fan & Blower Co., Chicago.
Northern Blower Co., Cleveland.

HUMIDIFIER FITTINGS

See Fittings, Humidifier, Water Line

HUMIDIFIER VALVES

See Valves, Humidifier, Water Level

HUMIDIFIERS, FURNACE, EVAPORATION, AUTOMATIC

Agricola Furnace Co., Inc., Gadsden, Ala.
• American Radiator & Standard Sanitary Corporation, Pittsburgh.
• Automatic Humidifier Co., Cedar Falls, Ia.
Bard Manufacturing Company, Bryan, Ohio.
Cary Mfg. Co., Waupaca, Wis.
Chandler Co., Cedar Rapids, Ia.
• Cleveland Humidifier Co., Cleveland.
Glasby Manufacturing Company, Inc., J. P., Bloomfield, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
• McDonnell & Miller, Chicago.
• Maid-O'-Mist, Inc., Chicago.
Marshall Furnace Co., Marshall, Mich.
• Mayflower Air Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
• Olsen Manufacturing Co., C. A., Elyria, Ohio.
• Patten Co., J. V., Syracuse, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pfening Co., Fred D., Columbus, Ohio.
• Premier Furnace Co., Dowagiac, Mich.
Scoville Mfg. Co., Waterbury, Conn.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Skilbeck Mfg. Co., Kenosha, Wis.
Skuttle Manufacturing Co., Detroit.
Somers, Inc., H. J., Detroit, Mich.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.

HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

• Air Controls, Inc., Cleveland.
American Foundry & Furnace Co., Bloomington, Ill.
• American Radiator and Standard Sanitary Corp., Pittsburgh.
Binks Mfg. Co., Chicago.
• Bishop & Babcock Mfg. Co., Cleveland.
Electric Sprayit Company, Sheboygan, Wis.
Handelan Washed Air Co., Minneapolis.
• Mayflower Air Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
Somers, Inc., H. J., Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Company, Chicago.
Supreme Electric Products Corp., Rochester, N. Y.

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HUMIDISTATS

Au-Temp-Co., Corp., New York City.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Friez Instrument Division, Towson, Md. (Human Hair)
H-B Instrument Co., Inc., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis. (Wood, Hair, Membrane)
● Minneapolis-Honeywell Regulator Co., Minneapolis (Human hair)
● Penn Electric Switch Co., Goshen, Ind.
Powers Regulator Co., Chicago.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

HUMIDITY CONTROLS

See Humidistats

HUMIDITY RECORDERS

See Recorders, Humidity

HYGROMETERS

Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia.
Fee and Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
General Scientific Equipment Co., Philadelphia.
H. B. Instrument Co., Inc., Philadelphia.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia. (Recording)
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Thermometers, Inc., Cincinnati.
Precision Thermometer and Instrument Co., Philadelphia.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Weksler Thermometer Corp., New York City.

INSULATING CEMENT

See Cement, Insulating

INSULATING WINDOWS, HEAT

See Windows, Heat Insulating

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago. (Rockwool)
Alfol Insulation Co., Inc., New York City. (Blanket)
Alton Mineral Wool Insulation Co., St. Louis.
Aluminum Company of America, Pittsburgh. (Reflective foil)
American Flange & Manufacturing Co., Inc., New York City. (Reflective)
American Hair & Felt Co., Chicago. (Hair)
Armstrong Cork Co., Lancaster, Pa. (Cork)
Bache & Co., Semon, New York City. (Glass)
Baldwin-Hill Co., Trenton, N. J. (Rockwool)
Barnhardt Manufacturing Co., Charlotte, N. C.
Barrett Division, Allied Chemical & Die Corporation, New York City. (Tar felt and rockwool)
Berger Furnace Mfg. Co., Pittsburgh (Rockwool, granulated, loose, batts)
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Cincinnati, O. (Rockwool)
Celotex Corp., Chicago.
Chamberlin Company of America, Detroit. (Batt, Rockwool)
Coast Insulating Corp., Los Angeles. (Rockwool Batts, Fill)
Cork Import Corp., Englewood, N. J. (Corkboard, Mineral Wool Board)
Cork Insulation Co., New York City. (Cork)
Dry-Zero Corporation, Chicago. (Blanket and Bound Batt)
Eagle-Picher Co., Cincinnati, O. (Mineral Wool)
Flintkote Co., New York City. (Fibre board and rockwool)
Ford Roofing Products Co., Chicago. (Board and rockwool)
Hinde & Dauch Paper Co., Sandusky, O. (Air-Cell)
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis. (Wood fibre)
International Vermiculite Co., Girard, Ill. (Loose fill)
Johns-Manville, New York City. (Rock wool, fibre board)
Johnston Tin Foil & Metal Co., St. Louis. (Paper backed foil)
Keasbey & Mattison Co., Ambler, Pa.
Keasbey Co., Robert A., New York City. (Rock wool)
● Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
Ludowici-Celadon Co., Chicago. (Wool)
Masonite Corp., Chicago. (Blankets)
Mundet Cork Corp., Brooklyn, N. Y. (Cork)
Munn and Steele, Inc., Newark, N. J. (Vermiculite)
National Gypsum Co., Buffalo, N. Y. (Rock Wool and Board)
● Owens-Corning Fiberglas Corporation, Toledo. (Board and Blanket)
Pacific Lumber Co., San Francisco. (Loose fill)
Pittsburgh Plate Glass Co., Pittsburgh. (Cellular Glass)
Plant Rubber & Asbestos Works, Inc., San Francisco.
Plastergon Wall Board Co., Buffalo.
Refractory & Insulation Corp., New York City. (Mineral wool, loose, granulated)
Reynolds Metals Co., Richmond, Va. (Reflective)
Riverton Lime & Stone Co., Inc., Riverton, Va. (Mineral Wool)
Robinson Insulation Co., Great Falls, Mont. (Loose Fill)
Ruberoid Co., New York City. (Rock wool)
Silvercote Products, Inc., Chicago. (Reflective fabric)
Sisalkraft Co., Chicago. (Reflective)
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago. (Asbestos, hair-felt)
Standard Lime & Stone Co., Baltimore, Md. (Rock wool)
Standard Rolling Mills, Incorporated, Brooklyn. (Reflective)
Tennessee Products Corp., Nashville, Tenn. (Mineral Wool)
Therminsul Corp. of America, Kalamazoo, Mich. (Batts, bulk, granulated)
Truscon Steel Co., Youngstown, O. (Board between metal sheets)
United Cork Companies, Kearney, N. J.
United States Gypsum Co., Chicago, Ill. (Wool and board)
United States Mineral Wool Co., Chicago. (Mineral Wool)
U. S. Rock Wool Co., Salt Lake City. (Granulated, Batt and Blanket)
Universal Gypsum & Lime Co., Chicago. (Loose fill)
Universal Zonolite Insulation Co., Chicago. (Loose Fill, Plaster)
Waukesha Lime & Stone Co., Waukesha, Wis. (Rock Wool batts and bulk)
Western Mineral Products Co., Omaha, Nebr. (Fill)
Western Rock Wool Corp., Huntington, Ind. (Fill)
● Wilson & Co., Inc., Chicago, Ill. (Flexible, Blanket, Board)
● Wilson, Inc., Grant, Chicago, Ill. (Rock Wool)
Wood Conversion Co., St. Paul, Minn. (Board and blanket)

INSULATION, DUCT

Acme Asbestos Covering & Flooring Co., Chicago.
Alfol Insulation Co., Inc., New York City. (Aluminum foil)
American Hair & Felt Co., Chicago, Ill. (Hair Felt)
Armstrong Cork Co., Lancaster, Pa.
Baldwin-Hill Company, Trenton, N. J. (Rockwool, block, blanket)
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Ohio.
Celotex Corp., Chicago.
Cork Import Corp., Englewood, N. J.
Cork Insulation Co., Inc., New York City. (Cork)
Dry-Zero Corporation, Chicago.
Eagle-Picher Co., Cincinnati, O. (Mineral Wool, block, blanket)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Co., Boston.
Goodrich Company, B. F., Akron, Ohio.
Hinde & Dauch Paper Co., Sandusky, Ohio.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.
International Vermiculite Co., Girard, Ill. (Block)
Johns-Manville, New York.
Keasbey & Mattison Co., Ambler, Pa. (85% Magnesia—Pipe and Blocks)
Keystone Asphalt Products Co., Chicago.
● Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
LaClede-Christy Clay Products Co., St. Louis, Mo.
Masonite Corporation, Chicago.
Mortel Co., J. W., Kankakee, Ill. (Adhesive)
Mundet Cork Corp., Brooklyn. (Cork)
Munn and Steele, Inc., Newark, N. J. (Plastic)
National Gypsum Co., Buffalo. (Rock Wool)
Norristown Magnesia & Asbestos Co., Norristown, Pa. (Thermal)
● Owens-Corning Fiberglas Corp., Toledo. (Board and Blanket)
Pittsburgh Corning Corporation, Pittsburgh. (Block)
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Cellular Glass)
Plant Rubber & Asbestos Works, Inc., San Francisco.
Quigley Co., Inc., New York City.
Refractory & Insulation Corp., New York City. (Inside Duct Lining)
Reynolds Metals Co., Richmond, Va. (Reflective)
Robinson Insulation Co., Great Falls, Mont.
Ruberoid Co., New York City. (Cellular)
● Sall Mountain Co., Chicago.
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United Cork Companies, Kearney, N. J.
United States Mineral Wool Co., Chicago. (Mineral Wool)
United States Rubber Co., New York City.
Universal Zonolite Insulation Co., Chicago. (Cement and Blocks)
Virginia Rubatex Div., Great American Industries, Inc., Bedford, Va.
Western Felt Works, Chicago. (Felt)
● Wilson & Co., Inc., Chicago. (Animal Hair)
● Wilson, Inc., Grant, Chicago.
Wood Conversion Co., St. Paul, Minn.

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INSULATION, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago. (Asbestos, Rockwool)
Alfol Insulation Co., Inc., New York City.
Baldwin-Hill Co., Trenton, N. J. (Rock Wool Block & Cement)
Carey Co., Philip, Lockland, Ohio.
Coast Insulating Corp., Los Angeles. (Rock Wool Cement)
Eagle-Picher Co., Cincinnati, O. (Blocks)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Green Fire Brick Co., A. P., Mexico, Mo. (Vermiculite)
International Vermiculite Co., Girard, Ill. (Block Cement)
Johns-Manville, New York City. (85% Magnesia)
Keasbey & Mattison Co., Ambler, Pa.
LaClede-Christy Clay Products Co., St. Louis. (Cement and Blocks)
Ludowici-Celadon Co., Chicago. (Fire Brick)
Munn and Steele, Inc., Newark, N. J. (Bonding, Castable)
Norristown, Magnesia & Asbestos Co., Norristown, Pa.
● Owens-Corning Fiberglas Corp., Toledo, O. (Blanket)
Plant Rubber & Asbestos Works, Inc., San Francisco. (Asbestos)
Plibrico Jointless Firebrick Co., Chicago. (Mineral Wool)
Quigley Company, Inc., New York City.
Refractory & Insulation Corp., New York City. (Block, Blanket)
Robinson Insulation Co., Great Falls, Mont. (High Temperature Cement)
Ruberoid Co., New York City. (Blocks, Asbestos Cement)
Smidth & Co., F. L., New York City.
Standard Asbestos Mfg. Co., Chicago.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United States Mineral Wool Co., Chicago.
Universal Zonolite Insulation Co., Chicago. (Cement, Bricks and Blocks)
● Wilson, Inc., Grant, Chicago. (Asbestos)

KITCHEN FANS

See Fans, Kitchen

LACQUERS

See Enamels and Lacquers

LAMPS, STERILIZING, FOR DUCT INSTALLATION

General Electric Co., Cleveland.
Rogers, Diesel & Aircraft Corporation, New York.
Westinghouse Electric Corporation, Bloomfield, N. J.

LEADER STRAPS

See Fittings and Accessories, Conductor

LIFTS, SKYLIGHT

● Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Biersach & Niedermeyer Company, Milwaukee.
Danzer Metal Works Co., Hagerstown, Md.
● Levow, David, New York City. (Gearing)
Park City Cornice Works, Inc., Bridgeport, Conn.
Royal-Apex Mfg. Co., Brooklyn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Van Noorden Co., E., Boston.
Weiss & Co., H., New York City.

LININGS, CHIMNEY

Condensation Engineering Co., Chicago.
● Williams-Wallace Co., San Francisco.

LINKS, FUSIBLE

Grinnell Co., Inc., Providence, R. I.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Steffens-Amberg Co., Newark, N. J.
Westinghouse Electric, East Pittsburgh, Pa.

LOUVRES AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

● Air Control Products, Inc., Coopersville, Mich. (Attic and roof Ventilators)
● Air Controls, Inc., Cleveland.
Air Conditioning Products Co., Detroit.
Airmaster Corp., Chicago.
Allen Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, Ohio.
Arex Co., Chicago.
Arlington Electric Co., St. Louis.
● Arr-O-Line, Minneapolis (attic ventilators)
Barber-Coleman Company, Rockford, Ill.
Belco Exhaust Fan Mfg. Co., St. Louis.
Biersach & Niedermeyer Co., Milwaukee.
● Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
Burt Mfg. Co., Akron, Ohio.
Campbell Heating Co., E. K., Kansas City, Mo.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
Clay Equipment Corp., Cedar Falls, Ia.
Controlair Manufacturing Co., Los Angeles.
DeBothezat Fans Division, East Moline, Ill.
Decatur Iron & Steel Co., Decatur, Ala.
Dual-Air Fan Corporation, Chicago.
Electrovent Fan & Mfg. Co., Chicago.
● Elgo Shutter & Mfg. Co., Detroit
Firecraft Corporation, Chicago (Stationary)
Gillian Mfg. Co., Detroit.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Howry-Berg Steel & Iron Works, Denver, Colo.
Hunter Fan & Ventilating Co., Memphis, Tenn.
International Engineering, Inc., Dayton, Ohio.
International Steel Company, Evansville, Ind.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
Kelvin-White Co., Boston.
Kirk & Blum Mfg. Co., Cincinnati.
Klee Co., George B., Cincinnati.
● Lakewood Engineering & Mfg. Co., Chicago.
● Lau Blower Co., Dayton, O.
Lockjoint Wood Products Co., Wichita, Kan. (Wood; stationary door, wall, window and ceiling)
Martin Fan & Blower Co., Chicago.
Maysteel Products, Inc., Milwaukee.
Meier Electric & Machine Co., Indianapolis.
Meyer Mfg. Co., Detroit.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
Myers Electric Co., Pittsburgh.
Nationalaire Corporation, Detroit.
Nelson Corporation, Herman, Moline, Ill.
Overly Manufacturing Co., Greensburg, Pa.
Peerless Electric Co., Warren, Ohio.
Reed Unit-Fans, Inc., New Orleans.
Riggin Metal Products, Kankakee, Ill.
Robertson Co., H. H., Pittsburgh.
Schoedinger, F. O., Columbus, Ohio.
Signal Electric Mfg. Co., Menominee, Mich.
Standard Stamping & Perforating Co., Chicago.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
● Swartwout Company, Cleveland.
● Trade-Wind Motorfans, Inc., Los Angeles.
● Tuttle & Bailey, Inc., New Britain, Conn.
● United States Register Co., Battle Creek, Mich.
Utility Appliance Corporation, Los Angeles.
Van Noorden Co., E., Boston.
● Waterloo Register Co., Waterloo, Ia.
Wing Mfg. Co., L. J., New York City.
Young Regulator Co., Cleveland.

MACHINERY, REBUILT AND USED

● Acme Equipment Co., Inc., Chicago.
Biggs Supply Co., B. C., Lincoln, Nebr.
Brooks Co., Inc., B. R., Boston.
Burns Machinery Co., F. W., Milwaukee.
● Central-West Machinery Co., Chicago.
● Federal Machinery Company, New York City. (Sheet Metal)
General Blower Co., Morton Grove, Ill.
Hyman & Sons, Joseph, Philadelphia.
● Interstate Machinery Co., Inc., Chicago.
● Maplewood Machinery Co., Inc., Chicago.
● Milton Equipment Co., Philadelphia.
Potts, Sons & Co., Inc., W. F., Philadelphia.
● Reiner & Campbell Co., Inc., Elizabeth, N. J.
St. Louis Tool Co., St. Louis.

MACHINES, BAR FOLDERS, HAND

● Barth Mfg. Co., Milldale, Conn.
Frederick Iron & Steel, Inc., Frederick, Md.
● Niagara Machine & Tool Works, Buffalo.
● Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis.

MACHINES, BEADING, HAND

● Barth Mfg. Co., Milldale, Conn.
● Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio.
● Peck, Stow & Wilcox Co., Southington, Conn.
Robertson, F. L., Buffalo.

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MACHINES, BEADING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Swain Mfg. Co., Fred J., St. Louis.

MACHINES, BURRING, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, BURRING, POWER

Independent Pneumatic Tool Co., Chicago.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, CLEAT BENDING, HAND

• Smith, R. E., Waukegan, Ill.

MACHINES, COMBINATION, HAND

(Beading, Burring, Turning, Wiring, etc.)

• Barth Mfg. Co., Milldale, Conn.
Frederick Iron & Steel, Inc., Frederick, Md.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio. (Beading—Rotary Snips)
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, COMBINATION, POWER

(Beading, Burring, Turning, Wiring, etc.)

• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Whiting Corporation, Harvey, Illinois.
• Wysong & Miles Co., Greensboro, N. C.

MACHINES, CRIMPING, HAND

• Barth Mfg. Co., Milldale, Conn.
C-B Tool Co., Lancaster, Pa.
• Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, CRIMPING, POWER

• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, Ohio.

MACHINES, DIMPLING, ELECTRIC

York Electric Tool Co., York, Pa.

MACHINES, DOUBLE SEAMER, ROOF, POWER

• Niagara Machine & Tool Works, Buffalo.
Streine Tool & Mfg. Co., New Bremen, Ohio.

MACHINES, ELBOW, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, ELBOW, POWER

• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, FILING

Air-Speed Tool Co., Los Angeles. (Pneumatic)
DoAll Company, Des Plaines, Ill.
DoAll Company, Minneapolis.
Ideal Industries, Inc., Sycamore, Ill. (Rotary)
United States Electrical Tool Co., Cincinnati.

MACHINES, FLANGING, HAND

• Barth Mfg. Co., Plantsville, Conn.
Excelsior Tool & Machine Co., East St. Louis, Ill.
• Lockformer Co., Chicago.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
"Original" Metal Flanging Machine Works, Seattle, Wash.
Packham Crimper Co., Mechanicsburg, Ohio.
• Peck, Stow & Wilcox Co., Southington, Conn.
Ward Machinery Co., Chicago.
Weiss & Co., H., New York.

MACHINES, FLANGING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works Co., Cleveland.
• Lockformer Co., Chicago.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Swain Mfg. Co., Fred J., St. Louis.
Whiting Corp., Harvey, Ill.

MACHINES, GROOVING, HAND

• Barth Mfg. Co., Milldale, Conn.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Whitney Metal Tool Co., Rockford, Ill.

MACHINES, GROOVING, POWER

• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, GUTTER FORMING, HAND

•Kane & Roach, Inc., Syracuse, N. Y.
Robertson, F. L., Buffalo.

MACHINES, LATHE

(for Metal Spinning)

• Ermac Company, Los Angeles.

MACHINES, NIBBLING, HAND

National Machine Tool Co., Racine, Wis.
Skilsaw, Inc., Chicago.

MACHINES, NIBBLING, POWER

Campbell, Andrew C., Div. of American Chain & Cable Co., Inc., Bridgeport, Conn.
Independent Pneumatic Tool Co., Chicago. (Portable)
Kling Bros. Engineering Works, Chicago.
• Libert Machine Co., Green Bay, Wis.
St. Louis Tool Co., St. Louis.
Savage Co., W. J., Knoxville, Tenn.

MACHINES, PIPE, LOCK FORMING, POWER

Kane & Roach, Inc., Syracuse, N. Y.
• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.

MACHINES, PITTSBURGH LOCK FORMING

• Lockformer Co., Chicago.
• Maplewood Machinery Co., Chicago.
• Riverside Machinery Co., Shakopee, Minn.

MACHINES, PITTSBURGH LOCK OPENERS

• Maplewood Machinery Co., Chicago.

MACHINES, ROLL FORMING, POWER

(For Mouldings and Shapes)

Dahlstrom Machine Works, Chicago.
Kane & Roach, Inc., Syracuse, N. Y.
• Maplewood Machinery Co., Chicago.
Tishken Products, Detroit.
Yoder Company, Cleveland.

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MACHINES, SEAMING, HAND

Enderle, Inc., Ltd., Frank X., Los Angeles.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York.

MACHINES, SEAMING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
• Lockformer Co., Chicago.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, Ohio.
Swain Mfg. Co., Fred J., St. Louis.

MACHINES, SETTING DOWN, HAND

• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SETTING DOWN, POWER

Callahan Can Machine Co., Inc., Brooklyn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SLIP ROLL FORMING, HAND

• Barth Mfg. Co., Milldale, Conn.
Bertsch & Co., Cambridge City, Ind.
Frederick Iron & Steel, Inc., Frederick, Md.
Hendley & Wittemore Co., Beloit, Wis.
• Milton Equipment Co., Philadelphia.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Riverside Machinery Co., Shakopee, Minn.
San Angelo Foundry & Machine Company, San Angelo, Tex.
• Wysong & Miles Co., Greensboro, N. C.

MACHINES, SLIP ROLL FORMING, POWER

Bertsch & Co., Cambridge City, Ind.
• Dahlstrom Machine Works, Chicago.
Hendley & Wittemore Co., Beloit, Wis.
• Maplewood Machinery Co., Chicago.
• Milton Equipment Co., Philadelphia.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
San Angelo Foundry & Machine Company, San Angelo, Tex.
• Wysong & Miles Co., Greensboro, N. C.

MACHINES, SLITTING, HAND

• Barth Mfg. Co., Milldale, Conn.
Bertsch & Co., Cambridge City, Ind.
• Beverly Shear Co., Chicago.
Buffalo Forge Co., Buffalo.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Ward Machinery Co., Chicago.
• Whitney Metal Tool Co., Rockford, Ill.

MACHINES, SLITTING, POWER

Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Detroit.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Hendley & Whittemore Co., Beloit, Wis.
Kane & Roach, Inc., Syracuse, N. Y.
• Libert Machine Co., Green Bay, Wis. (Rotary)
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis.
Streine Tool & Mfg. Co., New Bremen, Ohio.
Whiting Corp., Harvey, Ill.
Yoder Co., Cleveland.

MACHINES, WIRING, HAND

• Barth Mfg. Co., Milldale, Conn.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, WIRING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works Co., Cleveland.
• Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MALLETS, METAL WORKING

Belmont Smelting & Refining Works, Inc., Brooklyn (Lead)
Bernz Company, Otto, Rochester, N. Y. (Dogwood)
Chicago Rawhide Mfg. Co., Chicago, Ill.
Densewood Corporation, Elkhorn, Wis. (Wood)
Goodrich Company, B. F., Akron, Ohio. (Rubber)
Greene, Tweed & Co., New York City. (Plastic)
Lignum-Vitae Products Corp., Jersey City, N. J.
• Maplewood Machinery Co., Chicago.
• Morey, Dan, Los Angeles.
New Plastic Corporation, Hollywood, Calif. (Plastic)
• Niagara Machine & Tool Works, Buffalo. (Hickory)
Southwest Manufacturing Co., Santa Ana, Calif. (Pyralin tipped)
Stanley Tools, New Britain, Conn. (Soft face hammers)
Stossel & Sons Co., Carl, Front Royal, Va.

MATS, FOR EVAPORATIVE COOLERS

Beckett & Co., Thomas, Dallas, Tex. (Aspen Fiber)
• Morey, Dan, Los Angeles.
• Owens-Corning Fiberglas Corporation, Toledo, O.
• Palmer Manufacturing Corp., Phoenix, Ariz.

METAL CEILINGS

See Ceilings, Metal

METAL HOSE

See Hose, Metal

METAL PROTECTING

See Paint, Metal Protecting

METAL SPRAY GUNS

See Guns, Spray, Metals

METAL STAMPINGS

See Stampings, Metal

METALS, PERFORATED, SHEET AND PLATE

Beckley Perforating Co., Garwood, N. J.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Perforating Co., Chicago.
Cross Engineering Co., Carbondale, Pa.
Diamond Manufacturing Co., Wyoming, Pa.
Erdle Perforating Co., Rochester, N. Y.
• Harrington & King Perforating Co., Chicago, Ill.
Hendrick Mfg. Co., Carbondale, Pa.
Johnston & Chapman Co., Chicago.
Littleford Bros., Inc., Cincinnati.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Mundt & Sons, Charles, Jersey City, N. J.
Nortmann-Duffke Co., Milwaukee.
• Revere Copper and Brass Incorporated, New York.
Rigid-Tex Corporation, Buffalo.
Standard Stamping & Perforating Co., Chicago.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., Buffalo.

METERS, AIR VELOCITY, DIRECT READING

Detroit Air Conditioning Service Co., Inc., Detroit.
Hays Corporation, Michigan City, Ind.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.

MONORAIL SYSTEMS

(Track, Trolley, Hoist, Accessories)

American MonoRail Co., Cleveland.
Chicago Tramrail Co., Chicago.
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Ferdon Equipment Engineering Co., Hillside, N. J.
Louden Company, Fairfield, Iowa.
Philadelphia Tramrail Co., Philadelphia.
Reading Chain & Block Corporation, Reading, Pa.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Webb Co., Jervis B., Detroit.

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MOTORS, DAMPER, DUCT, MODULATING OR PROPORTIONING

Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Hotstream Heater Co., Cleveland.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
● White Manufacturing Co., St. Paul, Minn.

MOTORS, DAMPER, DUCT, TWO-POSITION

Au-Temp-Co Corp., New York City.
● Automatic Products Co., Milwaukee.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Crown Controls Company, New Bremen, Ohio.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
● Penn Electric Switch Co., Goshen, Ind.
● Sampsel Time Control, Inc., Spring Valley, Ill.
● White Manufacturing Co., St. Paul, Minn.

MOTORS, DAMPER, FURNACE DRAFT, ELECTRICAL

Au-Temp-Co Corp., New York City.
● Automatic Products Co., Milwaukee.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Crise Electric Mfg. Co., Columbus, Ohio.
Crown Controls Company, New Bremen, Ohio.
Defender Instrument & Regulator Co., St. Louis.
● Gleason-Avery, Inc., Auburn, N. Y.
Janette Mfg. Co., Chicago.
Master Electric Company, Dayton, Ohio.
● Mercoid Corporation, Chicago, Ill.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
● Penn Electric Switch Co., Goshen, Ind.
● Perfex Corporation, Milwaukee.
● Sampsel Time Control, Inc., Spring Valley, Ill.
● White Manufacturing Co., St. Paul, Minn.
● White-Rodgers Electric Co., St. Louis.

MOTORS, ELECTRIC, FRACTIONAL H. P.

Ampex Electric Corporation, San Carlos, Calif.
Baldor Electric Co., St. Louis.
Barber-Colman Co., Rockford, Ill. (A. C.)
Bodine Electric Co., Chicago.
Brown-Brockmeyer Co., Inc., Dayton, Ohio.
Canatsey Electric Mfg. Co., Kansas City, Mo.
● Century Electric Co., St. Louis.
Crise Mfg. Co., Columbus, Ohio.
Dayton-Acme Co., Cincinnati.
Delco Appliance Div. General Motors Corp., Rochester, N. Y.
Delco Products Division, General Motors Corp., Dayton, Ohio.
Diehl Mfg. Co., Somerville, N. J.
Dynamic Air Engineering, Inc., Los Angeles.
Eastern Air Devices, Inc., Brooklyn.
Electric Sprayit Co., Sheboygan, Wis.
Emerson Electric Mfg. Co., St. Louis.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Holtzer-Cabot Electric Co., Boston.
Howell Electric Motors Co., Howell, Mich.
Jack & Heintz, Inc., Cleveland.
Janette Mfg. Co., Chicago.
Lamb Electric Company, Kent, Ohio.
Leland Electric Co., Inc., Dayton, Ohio.
Marble-Card Electric Co., Gladstone, Mich.
Marathon Electric Mfg. Corp., Wausau, Wis.
Master Electric Co., Dayton, Ohio.
Ohio Electric Mfg. Co., Cleveland.
Packard Electric Div., General Motors Corp., Detroit.
Peerless Electric Co., Warren, Ohio.
Pioneer Gen-E-Motor, Chicago.
Piqua Machine & Manufacturing Co., Inc., Piqua, Ohio.
Redmond Co., A. G., Owosso, Mich.
Reynolds Electric Company, Chicago.
Robbins & Myers, Inc., Springfield, Ohio.
Rotor Corporation, Dayton, Ohio.
Signal Electric Mfg. Co., Menominee, Mich.
Small Motors, Inc., Chicago.
Smith Manufacturing Co., Inc., F. A., Rochester, N. Y.
Speedway Mfg. Co., Cicero, Ill.
Standard Motor Corporation, Elyria, Ohio.
Victor Electric Products, Inc., Cincinnati.
Wagner Electric Corp., St. Louis.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

MOTORS, ELECTRIC, I H. P. AND OVER

Allis-Chalmers Mfg. Co., Milwaukee.
Allis Co., Louis, Milwaukee.
Baldor Electric Co., St. Louis.
Bogue Electric Co., Paterson, N. J.
Brown-Brockmeyer Co., Inc., Dayton, Ohio.
Burke Electric Co., Erie, Pa.
● Century Electric Co., St. Louis.
Crocker-Wheeler Elec. Mfg. Co., Ampere, N. J.
Delco Products Division, General Motors Corp., Dayton, Ohio.
Diehl Mfg. Co., Somerville, N. J.
Electric Machinery Mfg. Co., Minneapolis.
Electro Dynamic Div., Electric Boat Co., Bayonne, N. J.
Emerson Electric Mfg. Co., St. Louis.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Holtzer-Cabot Electric Co., Boston.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, Ohio.
Imperial Electric Co., Akron, Ohio.
Jackson Co., Byron, Los Angeles. (Submersible)
Janette Mfg. Co., Chicago.
Leland Electric Co., Inc., Dayton, Ohio.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Master Electric Co., Dayton, Ohio.
Peerless Electric Co., Warren, Ohio.
Philadelphia Gear Works, Inc., Philadelphia. (Geared)
Reliance Elec. & Engr. Co., Cleveland.
Robbins & Myers, Inc., Springfield, Ohio.
Standard Electric Division, Standard Dayton Corporation, Dayton, Ohio.
Star Electric Motor Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles.
U. S. Electrical Motors, Inc., Los Angeles.
Valley Electric Co., St. Louis.
Wagner Electric Corp., St. Louis.
Westinghouse Electric Corporation, East Pittsburgh.

MOULDING AND TRIM, ORNAMENTAL, FOR CABINETS AND CASINGS

Alden Manufacturing Co., Painesville, O.
Allmetal Weatherstrip Co., Chicago.
Aluminum Co. of America, Pittsburgh.
Aluminum Goods Mfg. Co., Manitowoc, Wis. (aluminum and stainless)
American Insulator Corporation, New Freedom, Pa. (plastic)
Brasco Manufacturing Co., Harvey, Ill.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Moulding Div., L. A. Young Spring & Wire Corp., Detroit.
Edwards Manufacturing Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Extruded Plastics, Inc., Norwalk, Conn.
Friedley-Voshardt Co., Chicago.
Herron-Zimmers Moulding Co., Detroit.
Jamestown Metal Corp., Jamestown, N. Y.
Kawneer Co., Niles, Mich.
● Lau Blower Co., Dayton, O.
Maysteel Products, Inc., Milwaukee.
● Miller & Doing, Brooklyn, N. Y.
Pyramid Metals Co., Chicago.
● Revere Copper & Brass Incorporated, New York City.
Rigid-Tex Corporation, Buffalo.
United States Stoneware Co., Akron, O., and New York City.
Werner Co., Inc., R. D., New York City. (Aluminum plastic)

MOULDINGS AND TRIM FOR SIDING AND SHINGLES

Allmetal Weatherstrip Co., Chicago (Zinc)
Appleton Supply Co., Appleton, Wis. (Zinc)
Royal-Apex Mfg. Corp., Brooklyn. (Bull Nose Corner Bead)
Sioux Steel Co., Sioux Falls, S. D. (Galv. iron)

NAILS, ALUMINUM

Aluminum Co. of America, Pittsburgh.
Hassall, Inc., John, Brooklyn.
Maze Company, W. H., Peru, Ill.

NAILS, COPPER

American Steel & Wire Co., Cleveland.
Chase Brass and Copper Co., Inc., Waterbury, Conn.
Columbia Steel Co., San Francisco, Calif.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Copperweld Steel Co., Glassport, Pa.
Grammes & Sons, Inc., L. F., Allentown, Pa.
Hassall, Inc., John, Brooklyn.
● Hussey & Co., C. G., Pittsburgh.
Maze Co., W. H., Peru, Ill.

NAILS, HARDENED MASONRY

American Steel & Wire Co., Cleveland.
Hillwood Manufacturing Co., Cleveland. (Concrete Pinsors)

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● Parker-Kalon Corp., New York City.
Rawlplug Co., Inc., New York City. (Bolts)
Tremont Nail Co., Wareham, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.

NAILS, ROOFING

American Steel & Wire Co., Cleveland.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
● Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Columbia Steel Co., San Francisco.
Conklin Brass & Copper Co., Inc., T. E., New York City. (Copper)
● Continental Steel Corp., Kokomo, Ind.
Deniston Co., Chicago.
Dickson Weatherproof Nail Co., Evanston, Ill. (Lead headed).
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Hassall, Inc., John, Brooklyn.
● Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
● Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
● Republic Steel Corp., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

NAILS, SCREW, HARDENED

American Steel & Wire Co., Cleveland.
Dickson Weatherproof Nail Co., Evanston, Ill.
Hillwood Manufacturing Co., Cleveland. (Drive)
Industrial Screw Company, Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
● Parker-Kalon Corp., New York City.
● Republic Steel Corp., Cleveland.

NAILS, STAINLESS STEEL

American Steel & Wire Co., Cleveland.
Hassall, Inc., John, Brooklyn.
Maze Co., W. H., Peru, Ill.
● Republic Steel Corp., Cleveland, O.
Tremont Nail Co., Wareham, Mass.

NAILS, ZINC COATED

American Steel & Wire Co., Cleveland.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
● Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco.
● Continental Steel Corp., Kokomo, Ind.
Dickson Weatherproof Nail Co., Evanston, Ill.
Grammes & Sons, Inc., L. F., Allentown, Pa.
Hassall, Inc., John, Brooklyn.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
● Republic Steel Corp., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tremont Nail Co., Wareham, Mass.
Youngstown Sheet & Tube Co., Youngstown, Pa.

NAME PLATES

See Hardware, for Cabinets and Casings

NIBBLERS

See Machines, Nibbling

NIGHT AIR FANS

See Fans, Night Air Cooling

NOZZLES, SPRAY, WATER

American Cooling Tower Co., Kansas City, Mo.
April Showers Co., Washington, D. C. (Roof cooling)
Ballioffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
● Bayley Blower Co., Milwaukee.
Benjamin Air Rifle Co., St. Louis.
Binks Mfg. Co., Chicago.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Chain Belt Co., Milwaukee.
● Clarage Fan Co., Kalamazoo, Mich.
Delavan Engineering Co., Des Moines, Ia.
Electric Sprayit Co., Sheboygan, Wis.
Link-Belt Co., Chicago.
Marley Co., Kansas City, Kan.
Martocello & Co., Jos. A., Philadelphia.
Monarch Mfg. Works, Inc., Philadelphia.
National Engineering & Manufacturing Co., Kansas City, Mo.
Phillips Cooling Tower Co., Inc., New York City.
Plummer Spray Equipment Co., Napoleon, Ohio.
Rega Mfg. Co., Rochester, N. Y.
Ross Sprinkler Co., Pasadena, Calif.
Ruppright, Siegfried, Los Angeles. (Roof Cooling)
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Chicago.
Sturtevant Co., B. F., Div., Westinghouse Electric, Hyde Park, Mass.
Supreme Electric Products Corp., Rochester, N. Y.
Thermal Industries, Indio, Calif.
Water Cooling Corp., New York City.
Water Cooling Equipment Corp., St. Louis.
Yarnall-Waring Co., Philadelphia.

ODOR ADSORBERS

See Adsorbers, Odor

OFFSETS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

OIL BURNERS

See Burners, Oil

OIL FILTERS

See Fittings and Accessories, Oil Burner

ORNAMENTS, SHEET METAL

See Mouldings and Trim, Ornamental

OXY-ACETYLENE WELDING EQUIPMENT

See Welding Equipment, Oxy-Acetylene

OZONE APPARATUS

A & J Co., Chicago.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Coroaire Heater Corp., Cleveland.
Electroaire Corp., Long Island City.
Montgomery Bros., San Francisco.
Norwood Filtration Co., The, Florence, Mass.
Scottdale Ozone Company, Scottdale, Pa.

PAINT, ALUMINUM

● Allen Co., Inc., L. B., Chicago.
Aluminum Co. of America, Pittsburgh.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carter Paint Co., Liberty, Ind.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Flood Company, Cleveland.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Goodrich Co., B. F., Akron, O.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hilo Varnish Corp., Brooklyn.
Horn Co., Inc., A. C., Long Island City, N. Y.
● Illinois Bronze Powder Co., Inc., Chicago.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
Midland Paint & Varnish Co., Cleveland.
National Mfg. Corp., Tonowanda, N. Y.
Nebel Manufacturing Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Pittsburgh Plate Glass Co., Pittsburgh.
Presstite Engineering Co., St. Louis.
● Prole & Coogan Heating Co., Pittsburgh.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Robertson Co., H. H., Pittsburgh.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony Oil Co., Inc., New York City.

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Sonneborn Sons, Inc., L., New York.
Southern States Iron Roofing Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
Westinghouse Electric Corp., East Pittsburgh, Pa.
Wilbur & Williams Co., Boston, Mass.

PAINT, FINISH COAT

American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Dye Corp., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia. (Aluminum)
Carey Mfg. Co., Phillip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., Brooklyn. (Enamels)
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Eagle-Picher Co., Cincinnati.
Flood Co., Cleveland.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Hilo Varnish Corp., Brooklyn. (Zinc Chromate)
Horn Co., Inc., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Iowa Paint Manufacturing Co., Des Moines, Ia.
Irvington Varnish & Insulator Co., Irvington, N. J.
Koppers Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
Marley Chemical Co., Detroit.
Midland Paint & Varnish Co., Cleveland. (Red)
National Engineering Products, Inc., Washington, D. C.
National Lead Co., New York City.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Ohmlac Paint & Refining Co., Chicago.
Paraffine Companies, Inc., San Francisco.
Patterson-Sargent Co., Cleveland.
Pennsylvania Salt Mfg. Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
• Prole & Coogan Heating Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City. (Enamels)
Southern States Iron Roofing Co., Savannah, Ga.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tropical Paint & Oil Co., Cleveland. (Enamels)
Truscon Laboratories, Inc., Detroit.
Turco Products, Inc., Los Angeles.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Wattenamel Co., Summit, Ill.
Wilbur & Williams Co., Boston.
Wilhelm Co., A., Reading, Pa.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, ROOFING

American-Marietta Co., Chicago.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Die Corp., New York City. (Pitch)
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Clinton Metallic Paint Co., Clinton, N. Y. (Red Metallic and Venetian)
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O. (All Kinds)
Debevoise Co., Brooklyn.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Eastern States Supply Co., Brooklyn, N. Y.
Evercrete Corp., New York City.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., Inc., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)
Koppers Co., Pittsburgh. (Bituminous)
Lastik Products Co., Inc., Pittsburgh. (Asphalt, Fibre)
Lehon Co., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Lyon, Conklin & Co., Inc., Baltimore.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland. (Fibercote)
Mortell Co., J. W., Kankakee, Ill.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago, Ill. (Asphalt)
Pittsburgh Plate Glass Co., Pittsburgh.
• Prole & Coogan Heating Co., Pittsburgh.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt. (Asphalt)
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Sonneborn Sons, Inc., L., New York City.
Southern States Iron Roofing Co., Savannah, Ga.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Gutta Percha Paint Co., Providence, R. I.
United States Gypsum Co., Chicago.

PAINT SPRAY GUNS

See Guns, Spray, Paint

PAPER, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago.
Arabol Manufacturing Co., New York City. (Insulation Adhesive)
Carey Co., Philip, Lockland, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Johns-Manville, New York City.
Keasbey & Mattison Co., Ambler, Pa.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberoid Co., New York City.
• Sall Mountain Co., Chicago.
Standard Asbestos Mfg. Co., Chicago.
• Wilson, Inc., Grant, Chicago.

PASTE, ASBESTOS PAPER

Acme Asbestos Covering & Flooring Co., Chicago.
Clark Stek-O Corp., Rochester, N. Y.
Lyon, Conklin & Co., Inc., Baltimore.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Rutland Fire Clay Co., Rutland, Vt.
• Sall Mountain Co., Chicago.
Standard Asbestos Mfg. Co., Chicago.
Western Mineral Products Co., Omaha, Nebr.
• Williamson Heater Co., Cincinnati.
• Wilson, Inc., Grant, Chicago.

PATTERNS, BLUE PRINT, ELBOWS, SKYLIGHTS AND FITTINGS

Gray, G. L., New Haven, Conn.

PERFORATED METAL

See Metals, Perforated, Sheet and Plate

PILOTS, GAS BURNER

Ajax Thermostatic Controls Co., Cleveland.
• Bryant Heater Co., Cleveland.
Continental Instrument Co., Cleveland.
• Detroit Lubricator Co., Detroit.
Domestic Thermostat Co., Los Angeles.
• General Controls Co., Glendale, Calif.
Grayson Heat Control, Ltd., Lynwood, Calif.
Jae Manufacturing Co., Mt. Clemens, Mich.
Lowell & Grayson Mfg. Co., Monrovia, Calif.
• Mercoid Corporation, Chicago.

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Milwaukee Gas Specialty Co., Milwaukee.
Modern Materials, Inc., Detroit.
Newell & Sons, Irwin, Pa.
Patrol Valve Co., Cleveland.
• Rheem Manufacturing Co., New York City.
Roberts-Gordon Appliance Corp., Buffalo.
• Standard Remote Control Valve Co., Inc., South Pasadena, Calif.
Titan Valve & Mfg. Co., Cleveland.
• White-Rodgers Electric Co., St. Louis.

PILLOW BLOCKS

See Bearings, Pillow Block

PIPE, CONDUCTOR

• Ajax Furnace Fitting Co., Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, Ohio.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Downs-Smith Brass & Copper Co., New York City.
Edwards Manufacturing Co., Inc., Cincinnati.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh. (Copper)
Johns-Manville, New York City.
Klauer Manufacturing Co., Dubuque, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
• Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Obdyke, Inc., B. P., Philadelphia.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
St. Paul Corrugating Co., St. Paul, Minn.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Souther Iron Co., E. E., St. Louis.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
York Corrugating Co., York, Pa.

PIPE, FURNACE

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, Ohio.
Berger Furnace Mfg. Co., Pittsburgh.
Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
• Enderle, Inc., Ltd., Frank X., Los Angeles.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines.
Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Johns-Manville, New York City.
Keith Furnace Co., Des Moines, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Los Angeles Sheet Metal Manufacturing Co., Inc., Los Angeles.
Lyon, Conklin & Co., Inc., Baltimore.
• Majestic Co., Huntington, Ind.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
Maple City Furnace Co., Monmouth, Ill.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Manufacturing Co., C. A., Elyria, O.
Payne Furnace Co., Beverly Hills, Calif.
• Peerless Foundry Co., Indianapolis.
Penn Supply & Metal Corporation, Philadelphia.
Portland Stove Foundry Co., Portland, Me.
Ralph Supply Co., Inc., Wadsworth, Ohio.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Specialty Co., Pittsburgh.
Sioux Steel Co., Sioux Falls, S. D.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
• Superior Products Co., Omaha, Nebr.
Thor Metal Products Co., Inc., Syracuse, N. Y.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williamson Heater Co., Cincinnati.
• Williams-Wallace Co., San Francisco.

PIPE, SMOKE

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, Ohio.
Berger Furnace Mfg. Co., Pittsburgh.
Bieler & Son, L., Long Island City, N. Y.
Biersach & Niedermeyer Co., Milwaukee.
Bovee Furnace Works, Waterloo, Ia. (Cast Iron)
Braden Mfg. Co., Terre Haute, Ind.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Green Colonial Furnace Co., Des Moines, Ia.
Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Keith Furnace Co., Des Moines, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Manufacturing Co., C. A., Elyria, Ohio.
• Patten Co., J. V., Sycamore, Ill.
• Peerless Foundry Co., Inc., Indianapolis, Ind.
Penn Supply & Metal Corporation, Philadelphia.
Portland Stove Foundry Co., Portland, Me.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
• Superior Products Co., Omaha, Nebr.
Thor Metal Products, Inc., Syracuse, N. Y.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Wheeling Corrugating Co., Wheeling, W. Va.
Wilder Manufacturing Co., Niles, O.
• Williamson Heater Co., Cincinnati.
• Williams-Wallace Co., San Francisco.
• Wise Furnace Co., Akron, O.

PIPE LOCK FORMERS

See Machines, Pipe, Lock Forming

PIPE & FITTINGS, GAS VENT AND FLUE

• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Baltimore Enamel & Novelty Co., Baltimore. (Porcelain Enamel, Aluminum and Galvanized Iron)
• Char-Gale Mfg. Co., Minneapolis. (Blue and Galvanized)
• Condensation Engineering Corp., Chicago. (Vitreous Enamel)

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● Enderle, Inc., Ltd., Frank X., Los Angeles. (Oil, Gas)
● Heremetal Company, Minneapolis.
Johns-Manville, New York City.
Laclede Steel Co., St. Louis. (Butt Weld—Wrought Steel)
Payne Furnace Co., Beverly Hills, Calif. (Insulated Aluminum and Galv. Iron)
Tri-State Heating Supply Co., Fort Wayne, Ind.
Van Packer Corporation, Chicago.
Wilder Manufacturing Co., Niles, O.
● Williams-Wallace Co., San Francisco.

PIPE AND FITTINGS, SHEET METAL

See Ducts and Fittings, Prefabricated

PITTSBURGH LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

PLATES, ALLOY

Allegheny Ludlum Steel Corporation, Pittsburgh. (Stainless)
Aluminum Co. of America, Pittsburgh.
● American Brass Co., Waterbury, Conn. (Copper)
● American Rolling Mill Co., Middletown, O.
● Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn. (Copper and its alloys)
Dow Chemical Company, Midland, Mich. (Magnesium)
Great Lakes Steel Corporation, Ecorse, Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stainless Clad)
Inland Steel Company, Chicago.
International Nickel Co., Inc., New York City. (Monel, Nickel, Inconel)
Jessop Steel Co., Washington, Pa. (Air Craft)
Lukens Steel Co., Coatesville, Pa. (Alloy and Clad)
● Republic Steel Corp., Cleveland.
● Revere Copper & Brass Incorporated, New York City.
Reynolds Metals Company, Louisville, Ky. (Aluminum)
Universal-Cyclops Steel Corporation, Bridgeville, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, STEEL

● American Rolling Mill Co., Middletown, O.
● Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh.
Columbia Steel Co., San Francisco.
Granite City Steel Co., Granite City, Ill.
Great Lakes Steel Corp., Ecorse, Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stainless Clad)
Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jessop Steel Co., Washington, Pa.
Jones & Laughlin Steel Corp., Pittsburgh.
Lukens Steel Co., Coatesville, Pa.
● Republic Steel Corp., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wood Steel Co., Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, WROUGHT IRON

Byers Co., A. M., Pittsburgh.

POLISHERS

See Buffers, Grinders, Polishers, Sanders and Finishers, Metal

PREFABRICATED DUCTS

See Ducts and Fittings, Prefabricated

PRESSES AND DIES

Bath Co., Cyril, Cleveland.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Detroit.
Callahan Can Machine Co., Inc., Brooklyn.
Cincinnati Shaper Co., Cincinnati.
Clearing Machine Corp., Chicago. (Presses)
Cleveland Punch & Shear Works Co., Cleveland.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
Doelger & Kirsten, Inc., Milwaukee.
● Dreis & Krump Mfg. Co., Chicago.
Equipment Sales Co., Oakland, Calif.
Famco Machine Co., Racine, Wis. (Hand and foot)
Frederick Iron & Steel, Inc., Frederick, Md.
Henry & Wright Mfg. Co., Hartford, Conn.
Minster Machine Co., Minster, O.
New Albany Machine Mfg. Co., New Albany, Ind.
● Niagara Machine & Tool Works, Buffalo.
Pacific Industrial Mfg. Co., Oakland, Calif.
Swain Mfg. Co., Fred J., St. Louis.
● Verson Allsteel Press Co., Chicago.
Ward Machinery Co., Chicago.
● Wilson, K. R., Buffalo.
Zeh & Hahnemann Co., Newark, N. J.

PROTECTORS, DOWNSPOUT

See Fittings and Accessories, Conductor

PSYCHROMETERS, SLING AND HAND-ASPIRATED

Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
General Scientific Equipment Co., Philadelphia.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Inc., Philadelphia.
Johnson Service Co., Milwaukee.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Norwood, Cincinnati.
Precision Thermometer & Instrument Co., Philadelphia.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Weksler Thermometer Corp., New York City.

PULLEYS, FAN AND MOTOR

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit.
Dayton Rubber Mfg. Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. Y.
Dodge Mfg. Corp., Mishawaka, Ind.
Gates Rubber Co., Denver, Colo.
Goldens' Fdry. & Mach. Co., Columbus, Ga. (Cast Iron)
Jones Fdry. & Mach. Co., W. A., Chicago.
● Lau Blower Co., Dayton, O.
● Maurey Mfg. Corp., Chicago.
Mitchell Company, Incorporated, John E., Dallas, Tex. (V-groove)
● Morrison Products, Inc., Cleveland.
Pyott Fdry. & Mach. Co., Chicago.
Rockwood Mfg. Co., Indianapolis.
Scientiae Tool Company, Dayton, O.
Spun Steel Corp., Canton, O.
Swift Mfg. Co., Detroit, Mich.
Utility Appliance Corporation, Los Angeles.
Wood's Sons Co., T. B., Chambersburg, Pa.

PULLEYS, FURNACE CHAIN

● Hart & Cooley Mfg. Co., Holland, Mich.
● Mueller Furnace Co., L. J., Milwaukee.
● United States Register Co., Battle Creek, Mich.

PUMPS, FUEL OIL (for Oil Burners)

● Automatic Products Company, Milwaukee.
Kraissl Co., Inc., Hackensack, N. J.
May Oil Burner Div., Gerotor May Corp., Baltimore.
Monarch Manufacturing Works, Inc., Philadelphia.
● Polo Pump Co., Polo, Ill.
Roper Corp., Geo. D., Rockford, Ill.
Sundstrand Pump Div., Rockford, Ill.
Tuthill Pump Co., Chicago.
Viking Pump Company, Cedar Falls, Ia.
Wayne Home Equipment Co., Fort Wayne, Ind.
● Webster Electric Co., Racine, Wis.

PUMPS, RECIRCULATING, FOR EVAPORATIVE COOLERS

Beckett & Co., Inc., Thomas, Dallas, Tex. (Centrifugal)
● Morey, Dan, Los Angeles.

PUNCHES AND SHEARS COMBINED, LEVER OPERATED

Armstrong-Blum Mfg. Co., Chicago.
Bertsch & Co., Cambridge City, Ind.
Buffalo Forge Co., Buffalo.
C-B Tool Co., Lancaster, Pa. (Hole Punches)
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.

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National Machine Tool Co., Racine, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Rotex Punch Company, Oakland, Calif.
Weiss & Co., H., New York City.

PUNCHES, BENCH

Armstrong-Blum Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., J. F., Burlington, Vt.
• Maplewood Machinery Co., Chicago.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Rotex Punch Company, Oakland, Calif.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia. (Turret)

PUNCHES, COMBINATION HAND AND BENCH

Armstrong-Blum Mfg. Co., Chicago.
Champion Blower & Forge Co., Lancaster, Pa.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Parker-Kalon Corp., New York City.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Rotex Punch Company, Oakland, Calif.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, HAND

Allen, H. D., Los Angeles.
Armstrong-Blum Mfg. Co., Chicago.
Bertsch & Co., Cambridge City, Ind.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Works Co., Cleveland.
• Crescent Tool Co., Jamestown, N. Y.
• Damascus Steel Products Corporation, Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Ingels Elbow Machine Corporation, Chicago.
Kidder Mfg. Co., J. F., Burlington, Vt.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Parker-Kalon Corp., New York City.
• Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
• Rotex Punch Company, Oakland, Calif.
Stanley Tools, New Britain, Conn.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia. (Turret)

PUNCHES, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Detroit.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Henry & Wright Mfg. Co., Hartford, Conn.
King Bros. Engineering Works, Chicago.
Maxant Button & Supply Co., Chicago.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Swaine Mfg. Co., Fred J., St. Louis.
Thomas Machine Manufacturing Co., Pittsburgh.
• Verson Allsteel Press Co., Chicago.
Wales-Strippit Corporation, North Tonawanda, N. Y.
Weiss & Co., H., New York City.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia. (Turret)
Zeh & Hahnemann Co., Newark, N. J.

QUADRANTS, DAMPER

See Regulators, Damper Sets

RADIATOR COVERS, METAL

Harrison Radiator Cover Company, Chicago.

RECORDERS, HUMIDITY, PORTABLE

Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
• Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

RECORDERS, TEMPERATURE, PORTABLE

• Bacharach Industrial Instrument Co., Pittsburgh.
Bailey Meter Company, Cleveland.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Defender Instrument & Regulator Co., St. Louis.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Mason-Neilan Regulator Co., Boston.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Thermometers, Inc., Norwood, Cincinnati. (Mercury Actuated)
Preferred Utilities Mfg. Corp., New York City.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
United States Gauge, Sellersville, Pa.

REFRACTORIES

Babcock & Wilcox Co., New York City.
Bird Archer Co., Philadelphia.
Botfield Refractories Company, Philadelphia.
Chicago Fire Brick Co., Chicago.
Commonwealth Products Co., Philadelphia.
Denver Fire Clay Co., Denver, Colo.
Durex Co., Chicago.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
• Fireline Stove & Furnace Lining Co., Chicago. (For Hearths and Firepot Linings)
Green Fire Brick Co., A. P., Mexico, Mo.
Johns-Manville, New York City. (Cement and Monolithic)
Laclede-Christy Clay Products Co., St. Louis. (Fire Clay)
Ludowici-Celadon Co., Chicago.
McLeod & Henry Co., Inc., Troy, N. Y. (Silicon Carbide)
Munn and Steele, Inc., Newark, N. J.
Plibrico Jointless Firebrick Co., Chicago. (Castable and Plastic Fire Brick)
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City. (Firebrick and Cements)
Ramtite Co., Chicago. (Castable, Plastic)
Rehm, R., St. Albans, L. I., N. Y. (Radiant)
Refractory & Insulation Corp., New York City.
• Rex-Roto Corporation, Detroit.
Robinson Insulation Co., Great Falls, Mont. (Vermiculite)
Rutland Fire Clay Co., Rutland, Vt. (Retort Cement)
Standard Fuel Engineering Co., Detroit.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Walsh Refractories Corp., St. Louis.

REGALVANIZING EQUIPMENT AND MATERIALS

Galv-Weld Products, Dayton, O.

REGISTER SEALS

See Seals for Registers

REGISTER SHIELDS

See Shields, Warm Air Register

REFRIGERATING UNITS

See Compressors, Refrigerating

REGISTERS, DIRECTIONAL FLOW

• A-J Manufacturing Co., Kansas City, Mo.
• Air Control Products, Inc., Coopersville, Mich.
• Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee, Wis.
• Char-Gale Mfg. Co., Minneapolis.
Controlair Manufacturing Co., Los Angeles.
Diamond Manufacturing Co., Wyoming, Pa.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

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• Hart & Cooley Mfg. Co., Holland, Mich
Hendrick Mfg. Co., Carbondale, Pa.
• Independent Register Co., Cleveland
Midco Register Corporation, St. Paul.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Register & Grille Mfg. Co., Brooklyn.
• Rock Island Register Co., Rock Island, Ill.
Standard Stamping & Perforating Co., Chicago.
• Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Air Conditioning Corp., Minneapolis, Minn.
• United States Register Co., Battle Creek, Mich.
Utility Appliance Corp., Los Angeles.
• Waterloo Register Co., Waterloo, Ia.

REGISTERS, HEATING AND VENTILATING

• A-J Manufacturing Co., Kansas City, Mo. (Double Diffuser)
• Air Control Products, Inc., Coopersville, Mich.
American Warming & Ventilating Co., Toledo, O.
• Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee.
Brown Steel Tank Co., Minneapolis.
• Char-Gale Mfg. Company, Minneapolis.
Controlair Manufacturing Co., Los Angeles.
Diamond Mfg. Co., Wyoming, Pa.
• Effecto Grille Co., Detroit.
Empire Ventilation Equipment Co., Long Island City, N. Y.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Company, Des Moines, Ia.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
• Independent Register Co., Cleveland.
Midco Register Corporation, St. Paul.
• Mueller Furnace Co., L. J., Milwaukee.
Register & Grille Mfg. Co., Inc., Brooklyn.
• Rock Island Register Co., Rock Island, Ill.
Standard Stamping & Perforating Co., Chicago.
• Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.
• Waterloo Register Co., Waterloo, Ia.

REGULATORS, DAMPER SETS

• Adams Company, The, Dubuque, Ia.
• Air Control Products, Inc., Coopersville, Mich.
• Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.
• Cole-Sewell Engineering Co., St. Paul.
Controlair Manufacturing Co., Los Angeles.
Fossum Mfg. Co., M. H., St. Paul, Minn.
• Gerett Co., M. A., Milwaukee.
• Goese Mfg. Co., Milwaukee.
• Hart & Cooley Mfg. Co., Holland, Mich.
Kerentoff, G. L., Cincinnati.
Marcliff, Inc., Toledo, O.
Martens & Stormoen, Boston.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Ohio Products Co., Cleveland.
• Parker-Kalon Corp., New York City.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarcotherm Controls, Inc., New York City.
Trane Company, La Crosse, Wis.
• United States Register Co., Battle Creek, Mich.
Western Air Devices, Los Angeles.
Young Regulator Co., Cleveland.

REGULATORS, FURNACE DRAFT, MECHANICAL

Au-Temp-Co Corp., New York City.
Barber-Colman Co., Rockford, Ill.
Campbell Engineering Co., Appleton, Wis. (Electric)
Defender Instrument & Regulator Co., St. Louis.
Fulton Sylphon Co., Knoxville, Tenn.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland.
Little Janitor Furnace Clock Co., New York City.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
No-No Specialty Co., Cleveland.

RELAYS, ELECTRICAL

Allen-Bradley Co., Milwaukee.
American Instrument Co., Silver Spring, Md.
Arrow-Hart & Hageman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York City.
Automatic Switch Co., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn. (Time)
Cutler-Hammer, Inc., Milwaukee.
Davis & Co., Inc., Dean W., Chicago.
• Detroit Lubricator Co., Detroit.
Durakool, Inc., Elkhart, Ind. (Mercury)
Eastern Air Devices, Inc., Brooklyn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Electronic Products Co., St. Charles, Ill.
Ess Instrument Co., Fort Lee, N. J.
• General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
Guardian Electric Mfg. Co., Chicago.
H-B Instrument Co., Inc., Philadelphia.
Hart Mfg. Co., Hartford, Conn.
Industrial Engineering Corp., Terre Haute, Ind.
McCorkle Co., D. H., Berkeley, Calif.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Monitor Controller Co., Baltimore.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Philadelphia Thermometer Co., Philadelphia.
Photoswitch, Inc., Cambridge, Mass.
Precision Thermometer & Instrument Co., Philadelphia.
Reynolds Electric Co., Chicago.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Small Motors, Inc., Chicago.
Square D Co., Detroit.
Struthers-Dunn, Inc., Philadelphia.
Thrush & Co., H. A., Peru, Ind.
Tork Clock Company, Inc., Mount Vernon, N. Y.
Triplex Mfg. Co., Peru, Ind.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Weston Electrical Instrument Corp., Newark, N. J.
• White-Rodgers Electric Co., St. Louis.
Zenith Electric Co., Chicago.

REPAIRS, STOVE AND FURNACE

• Adams Company, The, Dubuque, Ia.
Associated Heater Parts Co., Chicago. (Furnace)
Banner Repair Parts Co., Youngstown, O.
• Brauer Supply Co., A. G., St. Louis.
Central Furnace & Stove Repair Co., St. Louis.
Cincinnati Stamping Co., Cincinnati.
Clark Co., Henry N., Boston.
• Des Moines Stove Repair Co., Des Moines, Ia.
Eselgroth & Co., Newark, N. J.
Faultless Heater Corp., Cleveland.
Foote Foundry Co., J. B., Fredericktown, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Klaine Co., F. A., Cincinnati, O.
Kramer Bros. Foundry Co., Dayton, O. (Furnace)
Livingston, Inc., Marshall, Mich.
Metzner Stove Repair Co., Kansas City, Mo.
• Mt. Vernon Furnace Mfg. Co., Mt. Vernon, Ill.
National Foundry & Furnace Co., Dayton, O.
• Northwestern Stove Repair Co., Chicago.
• Omaha Stove Repair Works, Omaha, Nebr.
• Peerless Foundry Co., Indianapolis, Ind.
Peninsular Stove Co., Detroit.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
• Pullen Stove & Furnace Repair Co., Geo. A., Denver, Colo.
Shamblen Furnace Parts Co., Pittsburgh.
Smith Furnace Co., New Castle, Pa.
Tri-State Heating Supply Co., Fort Wayne, Ind.

RETINNING EQUIPMENT AND MATERIALS

Galv-Weld Products, Dayton, O.
Retinning Manufacturing Co., Chicago.

RIDGE ROLLS AND RIDGING (METAL)

• American Rolling Mill Co., Middletown, O. (Galvanized)
American Steel & Wire Co., Cleveland.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa. (Metal)
Biersach & Niedermeyer Co., Milwaukee.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Edwards Mfg. Co., Inc., Cincinnati.
• Hussey & Co., C. G., Pittsburgh. (Copper)
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
Newport Rolling Mill Co., Newport, Ky.
Plasteel Products Co., Washington, Pa.
Reeves Steel & Mfg. Co., Dover, O.
Reynolds Metals Company, Louisville, Ky. (Aluminum)

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Riggin Metal Products, Kankakee, Ill.
St. Paul Corrugating Co., St. Paul, Minn
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux City, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Southern States Iron Roofing Co., Savannah, Ga.
Souther Iron Co., E. E., St. Louis.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Van Noorden Co., E., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.

RIDGE VENTILATORS

See Ventilators, Roof, Ridge

RIVETS, ALLOY

Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless)
• Bethlehem Steel Co., Bethlehem, Pa.
• Cherry Rivet Co., Los Angeles.
Clark Bros. Bolt Co., Millidale, Conn.
Cooper Co., Clark, Palmyra, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass. (Silver)
Hassall, Inc., John, Brooklyn.
Huck Manufacturing Company, Detroit.
• Republic Steel Corp., Cleveland.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.
Victory Mfg. Co., South Pasadena, Calif. (Plastic)

RIVETS, ALUMINUM

Aluminum Company of America, Pittsburgh.
• Cherry Rivet Co., Los Angeles. (Blind)
Chicago Rivet & Machine Co., Bellwood, Ill.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Explosive)
Goodrich Co., B. F., Akron, O. (Blind)
Hassall, Inc., John, Brooklyn.
Huck Manufacturing Co., Detroit.
Reynolds Metals Company, Louisville, Ky.
Shellmar Products Co., South Pasadena, Calif.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, BRASS, COPPER AND IRON

Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cherry Rivet Co., Los Angeles. (Blind)
Chicago Rivet & Machine Co., Bellwood, Ill.
Conklin Brass & Copper Co., Inc., T. E., New York City.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del. (Explosive)
Goodrich Co., B. F., Akron, O. (Blind-Brass)
Harper Co., H. M., Chicago.
Hassall, Inc., John, Brooklyn.
Huck Manufacturing Co., Detroit.
• Hussey & Co., C. G., Pittsburgh.
Taunton & Company, Inc., John H., New York City.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, STEEL

• Bethlehem Steel Co., Bethlehem, Pa.
• Cherry Rivet Co., Los Angeles. (Blind)
Chicago Rivet & Machine Co., Bellwood, Ill.
Clark Bros. Bolt Co., Millidale, Conn.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del. (Explosive—and Other Materials)
Huck Manufacturing Co., Detroit.
• Republic Steel Corporation, Cleveland.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

ROD, GAS WELDING

Air Reduction Sales Co., New York City.
• American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Crucible Steel Co. of America, New York City. (Stainless)
Dow Chemical Company, Midland, Mich. (Magnesium)
Eutectic Welding Alloys Company, New York City.
International Nickel Co., Inc., New York City. (Monel)
Linde Air Products Co., The, New York City.
Marquette Mfg. Co., Inc., Minneapolis.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div., Monessen, Pa. (Stainless Steel)
• Revere Copper & Brass Incorporated, New York City.
Universal Welder Corporation, Cleveland.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS

See Bearings, Roller

ROOFING, ALUMINUM

• Cheney Industries, Trenton, N. J. (Corrugated)
Fingles Co., Baltimore.
Overly Manufacturing Company, Greensburg, Pa.
Reynolds Metals Company, Louisville, Ky.
Southern States Iron Roofing Co., Savannah, Ga.

ROOFING, BUILT-UP

See Felt, Roofing

ROOFING, COPPER

• American Brass Co., Waterbury, Conn.
Braden Mfg. Co., Terre Haute, Ind.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
• Hussey & Co., C. G., Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
Overly Manufacturing Company, Greensburg, Pa.
Perkinson & Brown, Chicago.
• Revere Copper & Brass Incorporated, New York City.

ROOFING, LEAD

Alpha Metals, Inc., Brooklyn.
Belmont Smelting & Refining Works, Inc., Brooklyn. (Washers)
Federated Metals Division, American Smelting and Refining Company, New York City.
Flemm Lead Co., Inc., Long Island City, N. Y.
Illinois Zinc Co., Chicago.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Standard Rolling Mills, Inc., Brooklyn.

ROOFING, SLATE

North Bangor Slate Co., Bangor, Pa.
Perkinson & Brown, Chicago.
Sheldon Slate Products Co., Inc., Granville, N. Y. (Colors)
Structural Slate Co., Pen Argyl, Pa.
Vendor Slate Co., Inc., Nazareth, Pa.
Vermont Structural Slate Co., Inc., Fair Haven, Vt.

ROOFING, STEEL, AND STEEL, GALVANIZED

Airtherm Manufacturing Co., St. Louis. (Decking)
• Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• American Rolling Mill Co., Middletown, O.
American Steel Band Co., Pittsburgh.
American Steel & Wire Co., Cleveland.
Apollo Steel Company, Apollo, Pa.
Berger Mfg., Div. Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Byers Co., A. M., Pittsburgh. (Wrought Iron)
Carnegie-Illinois Steel Corp., Pittsburgh.
• Cheney Industries, Trenton, N. J. (Protective Coating—Corrugated)
Columbia Steel Co., Sub. U. S. Steel Corp., San Francisco.
• Continental Steel Corp., Kokomo, Ind.
Detroit Steel Products Co., Detroit.
Edwards Manufacturing Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Inland Steel Company, Chicago.
International Steel Company, Evansville, Ind.
Klauer Manufacturing Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
Overly Manufacturing Co., Greensburg, Pa.
Perkinson & Brown, Chicago.
Plasteel Products Co., Washington, Pa. (Protected)
Reeves Steel & Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Robertson Co., H. H., Pittsburgh. (Protected)
Sioux Steel Co., Sioux Falls, S. D.
St. Paul Corrugating Co., St. Paul, Minn.
Souther Iron Co., E. E., St. Louis.
Southern States Iron Roofing Co., Savannah, Ga.
Superior Sheet Steel Co., Div. Continental Steel Corp., Canton, Ohio.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Art Metal Co., Tiffin, Ohio.
Truscon Steel Co., Youngstown, O.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corporation, Wheeling, W. Va.

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ROOFING, TERNE PLATE

● Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
● American Rolling Mill Co., Middletown, Ohio.
Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
● Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh.
Edwards Manufacturing Co., Cincinnati.
Follansbee Steel Corporation, Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
Lyon-Conklin & Co., Inc., Baltimore.
● Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
● Republic Steel Corp., Cleveland.
Sioux Steel Co., Sioux Falls, S. D.
Wheeling Corrugating Company, Wheeling, W. Va.
Wheeling Metal & Mfg. Co., Moundsville, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ROOFING, TILE (CLAY AND CONCRETE)

Hood Co., B. Mifflin, Daisy, Tenn. (Clay)
Ludowici-Celadon Co., Chicago.
Perkinson & Brown, Chicago.
Truscon Laboratories, Detroit.
United States Gypsum Co., Chicago.

ROOFING, TIN

● Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Carnegie-Illinois Steel Corp., Pittsburgh.
Follansbee Steel Corporation, Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
Lyon, Conklin & Co., Inc., Baltimore.
● Milcor Steel Co., Milwaukee.
Perkinson & Brown, Chicago.
● Republic Steel Corp., Cleveland.
Sioux Steel Co., Sioux Falls, S. D.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

ROOFING, ZINC

Barnes Metal Products Co., Chicago.
Edwards Mfg. Co., Inc., Cincinnati.
Illinois Zinc Co., Chicago.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York City.
● Potts, Son & Co., Inc., W. F., Philadelphia.
Wheeling Corrugating Co., Wheeling, W. Va. (Coated)
Wheeling Steel Corp., Wheeling, W. Va. (Coated)

ROOFTRIM, STEEL (MOULDINGS) FOR EAVES AND RAKES

Appleton Supply Co., Appleton, Wis. (Starter Strip)
Penn Supply & Metal Corp., Philadelphia.
Sioux Steel Co., Sioux Falls, S. D.

RUST PROTECTION FOR METALS

See Chemicals, Rust Preventive

SAFETY GLASS

See Glass, Safety

SANDERS

See Buffers, Grinders, Polishers and Sanders

SAVERS, HEAT

Cary Mfg. Co., Waupaca, Wis.
Condensation Engineering Corp., Chicago.
Gerhardt, W. F., Richmond, Va. (oil or gas).
● Harvey-Whipple, Inc., Springfield, Mass.
Reynolds Electric Co., Chicago.

SAWS, BAND, SHEET METAL CUTTING

Atkins and Co., E. C., Indianapolis. (blades)
Barnes Co., Inc., W. O., Detroit. (blades)
Disston & Sons, Inc., Henry, Philadelphia. (blades)
DoAll Company, Des Plaines, Ill.
DoAll Company, Minneapolis.
● Ermac Company, Los Angeles.
Grob Brothers, Grafton, Wis.
Kalamazoo Tank & Silo Co., Kalamazoo, Mich. (blades)
Millers Falls Company, Greenfield, Mass.
Simonds Saw & Steel Co., Fitchburg, Mass.
Tannewitz Works, Grand Rapids, Mich.
Thompson & Son Co., Henry G., New Haven, Conn.
Wells Mfg. Corp., Three Rivers, Mich.

SAWS, HACK, POWER

Air-Speed Tool Co., Los Angeles. (Pneumatic)
Atkinson and Co., E. C., Indianapolis.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Precision Equipment Co., Chicago.
Disston & Sons, Inc., Henry, Tacony Sta., Philadelphia.
Racine Tool & Machine Co., Racine, Wis.
Robertson, F. L., Buffalo.

SCREENS, SUN REFLECTING

Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

SCREWS, FEED, STOKER

Chicago Steel Foundry Co., Chicago.
Crown Iron Works, Minneapolis, Minn.
Eagen, James & Sons, Wyoming, Pa.
● Schwab Safe Co., Lafayette, Ind.

SCREWS, SHEET METAL

Aluminum Co. of America, Pittsburgh. (Aluminum)
American Screw Co., Providence, R. I.
Continental Screw Co., New Bedford, Mass.
Elco Tool & Screw Corporation, Rockford, Ill.
Industrial Screw Co., Chicago.
National Lock Co., Rockford, Ill.
● Parker-Kalon Corp., New York City.
Pheoll Manufacturing Co., Chicago.
Rockford Screw Products Co., Rockford, Ill.
Shakeproof, Inc., Chicago.
● United States Register Co., Battle Creek, Mich.

SEALS FOR REGISTERS

● Excel Heating & Air Conditioning Co., Chicago.

SEAMER MACHINES

See Machines, Seaming

SETTING DOWN MACHINES

See Machines, Setting Down

SHEARS, CIRCLE, HAND

Compton Shear Co., W. H., Newark, N. J.
● Crescent Tool Co., Jamestown, N. Y.
Klenk's Aviation Snips, Wilmington, Del.
● Niagara Machine & Tool Works, Buffalo.
● Peck, Stow & Wilcox Co., Southington, Conn.
● Wiss & Sons Co., J., Newark, N. J.

SHEARS, CIRCLE, POWER

Bliss Co., E. W., Detroit.
Kling Bros. Engineering Works, Chicago.
● Libert Machine Co., Green Bay, Wis.
● Niagara Machine & Tool Works, Buffalo.
● Peck, Stow & Wilcox Co., Southington, Conn.
Whiting Corp., Harvey, Ill.
● Wysong & Miles Co., Greensboro, N. C.

SHEARS, ELECTRIC, PORTABLE

● Black & Decker Mfg. Co., Towson, Md.
O'Neil-Irwin Manufacturing Co., Lake City, Minn.
Skilsaw, Inc., Chicago.
Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Van Dorn Electric Tool Co., Towson, Md.
York Electric and Machine Company, York, Pa.

SHEARS AND PUNCHES COMBINED

See Punches and Shears Combined

SHEARS, HAND AND BENCH

See Snips and Shears, Bench and Hand

SHEARS, ROTARY, SLITTING, HAND

● Marshalltown Manufacturing Co., Marshalltown, Ia.
● Niagara Machine & Tool Works, Buffalo.
● Peck, Stow & Wilcox Co., Southington, Conn.
Ward Machinery Co., Chicago.

SHEARS, ROTARY, SLITTING, POWER

Bliss Co., E. W., Detroit.
Kling Bros. Engineering Works, Chicago.
Yoder Company, Cleveland.

SHEARS, SQUARING, FOOT

● Acme Equipment Co., Inc., Chicago.
● Barth Mfg. Co., Millidale, Conn.
Bertsch & Co., Cambridge City, Ind.
Famco Machine Co., Racine, Wis.
Frederick Iron & Steel, Inc., Frederick, Md.
● Niagara Machine & Tool Works, Buffalo.
● Peck, Stow & Wilcox Co., Southington, Conn.
● Whitney Metal Tool Co., Rockford, Ill.
● Wysong & Miles Co., Greensboro, N. C.

SHEARS, SQUARING, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss & Co., E. W., Detroit.

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Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
Cincinnati Shaper Co., Cincinnati.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Frederick Iron & Steel, Inc., Frederick, Md.
• Niagara Machine & Tool Works, Buffalo.
O'Neil-Irwin Manufacturing Co., Lake City, Minn.
Parker Manufacturing Company, Santa Monica, Calif.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, O.
• Whitney Metal Tool Company, Rockford, Ill.
• Wysong & Miles Co., Greensboro, N. C.

SHEET METAL PARTS

See Mouldings and Trim; also Stampings, Metal

SHEETS, ALUMINUM

Aluminum Company of America, Pittsburgh.
American Nickeloid Company, Peru, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Reynolds Metals Company, Louisville, Ky. (Corrugated)

SHEETS, CLAD

Allegheny Ludlum Steel Corporation, Pittsburgh.
Aluminum Company of America, Pittsburgh.
American Nickeloid Company, Peru, Ill. (Nickel, Chromium, Brass, Copper)
• American Rolling Mill Co., Middletown, O. (Aluminum)
General Plate, Div. Metals & Controls Corp., Attleboro, Mass. (Precious to Base Metal)
Granite City Steel Company, Granite City, Ill.
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa. (Stainless)
Lukens Steel Co., Coatesville, Pa. (Nickel, Monel, Inconel)

SHEETS, COPPER

• American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
• Hussey & Co., C. G., Pittsburgh.
• Revere Copper & Brass Incorporated, New York City.
Weirton Steel Co., Weirton, W. Va. (Electrolitic Zinc Coated)
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill. (Brass, Bronze, Phosphor Bronze)

SHEETS, COPPER, LEAD COATED

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Hussey & Co., C. G., Pittsburgh.
Lamb & Ritchie Co., Cambridge, Mass.
• Revere Copper & Brass Incorporated, New York City.

SHEETS, GALVANNEALED

Berger Mfg. Div., Republic Steel Corp., Canton, O.
Carnegie-Illinois Steel Corp., Pittsburgh.
• Continental Steel Corp., Kokomo, Ind.
Newport Rolling Mill Co., Div., Andrews Steel Co., Newport, Ky.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
Superior Sheet Steel Co., Canton, O.

SHEETS, LEAD

Alpha Metals, Inc., Brooklyn.
American Smelting and Refining Co., New York City.
Belmont Smelting & Refining Works, Inc., Brooklyn.
• Continental Steel Corp., Kokomo, Ind.
Eagle-Picher Co., Cincinnati.
Federated Metals Div., American Smelting and Refining Co., New York City.
Flemm Lead Co., Inc., Long Island City, N. Y.
Glaser Lead Co., Inc., Brooklyn.
Illinois Zinc Co., Chicago.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Standard Rolling Mills, Inc., Brooklyn.
• Weirton Steel Co., Weirton, W. Va. (Alloy Coated)

SHEETS, MAGNESIUM

Dow Chemical Company, Midland, Mich.
• Revere Copper and Brass Incorporated, New York City.

SHEETS, MONEL

International Nickel Company, Inc., New York City.

SHEETS, NICKEL

International Nickel Co., Inc., New York City.

SHEETS, SPECIAL METAL

(Nickel Zinc, Chrome Zinc, Nickel Coated Copper, Chromium Coated Copper, Nickel Coated Steel, Chromium Coated Steel, Chromium Coated Nickel Silver, Zinc Brass, Zinc Copper, etc.)

Allegheny Ludlum Steel Corporation, Pittsburgh. (Electrical)
• American Brass Co., Waterbury, Conn. (Copper-Silicon Alloys)
American Nickeloid Co., Peru, Ill.
Apollo Metal Works, Chicago. (Plated—Nickel Zinc, Nickel Copper, Chrome Copper, Chrome Steel, Nickel Steel, Zinc Steel, Chrome Brass)
Apollo Steel Co., Apollo, Pa.
• Bethlehem Steel Co., Bethlehem, Pa. (Nickel—Chromium)
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Muntz Metal, Nickel Silver, Phosphor Bronze).
Duriron Company, Inc., Dayton, O. (acid resisting)
• Hussey & Co., C. G., Pittsburgh.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
International Nickel Co., Inc., New York City. (Inconel)
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Milwaukee.
National Sheet Metal Co., Peru, Ill.
Reeves Steel & Manufacturing Co., Dover, O.
• Republic Steel Corp., Cleveland.
• Revere Copper & Brass Incorporated, New York City. (Silicon Bronze)
Robertson Co., H. H., Pittsburgh. (Protected)
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill. (Non-Ferrous).

SHEETS, STAINLESS

Allegheny Ludlum Steel Corporation, Pittsburgh.
• American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp., Pittsburgh.
Crucible Steel Co. of America, New York City (Two-Ply).
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
Superior Steel Corp., Pittsburgh.
Tennessee Coal, Iron and Railroad Co., Birmingham, Ala.
Universal-Cyclops Steel Corp., Bridgeville, Pa.
Washington Steel Corporation, Washington, Pa.

SHEETS, STEEL

(Polished and Blue, Corrugated and Plain, Black, Terne and Galvanized)

• American Rolling Mill Co., Middletown, O.
American Steel & Wire Co., Cleveland. (Galvanized)
Apollo Steel Co., Apollo, Pa.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh.
• Continental Steel Corporation, Kokomo, Ind.
Columbia Steel Co., San Francisco.
Crucible Steel Company of America, New York City.
Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Great Lakes Steel Corporation, Detroit.
Inland Steel Co., Chicago.
Jessop Steel Co., Washington, Pa. (Carbon, High-Speed, Alloy)
Jones & Laughlin Steel Corp., Pittsburgh.
Lyon, Conklin & Co., Inc., Baltimore.
Newport Rolling Mill Co., Newport, Ky.
Niles Rolling Mill Co., Niles, O.
Reeves Steel & Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O. (Galvanized, Hot Rolled and Long Ternes).
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wood Steel Company, Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, COPPER BEARING

• American Rolling Mill Co., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh.
Columbia Steel Co., San Francisco.
• Continental Steel Corp., Kokomo, Ind.
Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago. (Copper Alloy, Zinc Alloy)
Jones & Laughlin Steel Corp., Pittsburgh.
Newport Rolling Mill Co., Newport, Ky.
Reeves Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, TIN PLATE

Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
• Bethlehem Steel Co., Bethlehem, Pa.

Carnegie-Illinois Steel Corp., Pittsburgh
Follansbee Steel Corporation, Pittsburgh
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh. (Tinned)
Lyon, Conklin & Co., Inc., Baltimore.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, ZINC

American Nickeloid Co., Peru, Ill.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Downs-Smith Brass & Copper Co., Inc., New York City.
Hegeler Zinc Co., Danville, Ill.
Illinois Zinc Co., Chicago.
Mattiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York City.
• Potts, Son & Co., Inc., W. F., Philadelphia.

SHIELDS, WARM AIR REGISTER

Gammeter Co., W. F., Cadiz, O. (With Humidifier).
Kauffman Air Conditioning Corp., St. Louis.
Patent Novelty Company, Fulton, Ill. (With humidifier).
Schoedinger, F. O., Columbus, O.

SHINGLES AND TILE, METAL

• Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Berger Manufacturing Div., Republic Steel Corp., Canton, O.
Edwards Manufacturing Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
Globe Iron Roofing & Corrugating Co., Newport, Ky. (galvanized and painted terne).
Herbert & Sons, T. L., Nashville, Tenn.
Illinois Zinc Co., Chicago (Zinc)
• Miller & Doing, Brooklyn.
Reynolds Metals Company, Louisville, Ky. (Aluminum)
Sheet Metal Mfg. Co., Inc., Brooklyn.
Southern States Iron Roofing Co., Savannah, Ga. (steel and aluminum)
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galv. Steel).
Wheeling Corrugating Co., Wheeling, W. Va. (steel shingles).
• Williams-Wallace Co., San Francisco. (Painted tin and galv.)

SHUTTERS

See Louvres and Shutters

SHUTTERS AND DOORS, FIRE

See Doors and Shutters, Fire

SKYLIGHT LIFTS

See Lifts, Skylight

SKYLIGHTS

Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
• Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Biersach & Niedermeyer Co., Milwaukee.
Danzer Metal Works Co., Hagerstown, Md.
Edwards Mfg. Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
Flynn Mfg. Co., Michael, Philadelphia.
Gehri Company, Tacoma, Wash.
General Sheet Metal Works, Inc., Bridgeport, Conn. (Puttyless).
Herbert & Sons, T. L., Nashville, Tenn.
Hirschman-Pohle Co., Inc., LeRoy, N. Y. (Puttyless).
International Steel Co., Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lee & Son Co., Thomas, Cincinnati. (Ventilating, non-ventilating)
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Overly Manufacturing Co., Greensburgh, Pa.
Pennsylvania Wire Glass Co., Philadelphia. (corrugated wire glass)
Perkinson & Brown, Chicago.
Riester & Thesmacher Co., Cleveland.
Riggin Metal Products, Kankakee, Ill.
Robertson Co., H. H., Pittsburgh. (Structural)
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Souther Iron Co., E. E., St. Louis.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Vallas, Lionel, Chicago.
Van Noorden Co., E., Boston.
Vent-O-Lite Co., Chicago. (Industrial, Ventilating, Puttyless)
• Willis Steel Corporation, Galesburg, Ill. (Sheet Metal)
Winkler & Sons, Inc., A. E., Milwaukee.
York Corrugating Co., York, Pa.

SLEEVE BEARINGS

See Bearings, Sleeve

SLITTING MACHINES

See Machines, Slitting

SMOKE PIPE

See Pipe, Smoke

SNIPS AND SHEARS, BENCH AND HAND

Armstrong-Blum Mfg. Co., Chicago.
Bartlett Mfg. Co., Detroit.
Bergman Tool Mfg. Co., Buffalo. (Bench)
Berridge Shear Co., Sturgis, Mich. (hand)
• Beverly Shear Co., Chicago.
Bremil Mfg. Co., Erie, Pa. (Shears)
Clauss Shear Co., Freemont, O. (hand)
Compton Shear Co., W. H., Newark ,N. J.
• Crescent Tool Co., Jamestown, N. Y.
Grobet File Corp. of America, New York City.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Klenk's Aviation Snips, Wilmington, Del.
Lincoln Machine Co., Boston.
O'Neil-Irwin Manufacturing Co., Lake City, Minn.
Packham Crimmer Company, Mechanicsburg, O. (Nibler Snips)
• Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Company, Philadelphia.
Snap-On Tools Corporation, Kenosha, Wis.
Viking Shear Co., Erie, Pa. (Shears)
• Wiss & Sons Co., J., Newark, N. J.

SNOW GUARDS

See Guards, Snow

SOLDER

• Allen Co., Inc., L. B., Chicago. (bar, wire, powder, stainless)
Alpha Metals Inc., Brooklyn. (Silver & Tin-Lead)
• American Brass Co., Waterbury, Conn.
American Solder & Flux Co., Philadelphia (paste).
Belmont Smelting & Refining Works, Inc., Brooklyn (all kinds.)
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., New York City.
Eagle-Picher Co., Cincinnati (Bar and Wire).
Eastern States Supply Co., Brooklyn.
Empire Metal Co., Syracuse, N. Y.
Farrelloy Company, Inc., Philadelphia.
Federated Metals Division, American Smelting and Refining Company, New York City.
Flemm Lead Co., Inc., Long Island City.
Galv-Weld Products, Dayton, O. (Repair)
Gardiner Metal Co., Chicago. (bar)
Glaser Lead Co., Inc., Brooklyn.
Handy & Harman, New York City (silver).
Johnson Co., Lloyd S., Chicago.
Kester Solder Co., Chicago (Bar, Solid, Self-Fluxing Wire).
Klauer Mfg. Co., Dubuque, Ia.
Lukens Metal Co., Thos. F., Philadelphia.
Motex Metal Process Corporation, Detroit.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
• Ruby Chemical Co., Columbus, O. (Acid and Rosin Core).
Sheet Metal Mfg. Co., Inc., Brooklyn.
Standard Rolling Mills, Inc., Brooklyn.
Technical Processes Division, Colonial Alloys Company, Philadelphia. (Aluminum)

SOLDERING COPPERS

See Coppers, Soldering

SOLDERING FLUX

See Flux, Soldering

SOLDERING FURNACES

See Furnaces, Soldering

SOLDERING IRONS

See Coppers, Soldering

SOLDERING TORCHES

See Torches, Soldering

SOLENOID VALVES

See Valves, Solenoid

SOUND LEVEL INDICATORS

See Indicators, Sound Level

SPOT WELDERS

See Welders, Spot

SPRAY GUNS

See Guns, Spray

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

SQUARING MACHINES

See Machines, Squaring

STAMPINGS, METAL

Ackermann Manufacturing Company, Wheeling, W. Va.
Ames Co., W. R., San Francisco.
Bossert Company, Inc., Utica, N. Y.
Brasco Manufacturing Co., Harvey, Ill.
Burgess-Norton Mfg. Co., Geneva, Ill.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago (Rings).
Commercial Shearing & Stamping Co., Youngstown, O.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Dayton Rogers Mfg. Co., Minneapolis.
Detroit Stamping Co., Detroit.
Downs-Smith Brass & Copper Co., Inc., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Friedley-Voshardt Co., Chicago.
Geuder, Paeschke & Frey Co., Milwaukee.
Gillian Mfg. Co., Detroit.
Globe Machine & Stamping Co., Cleveland.
Grammes & Sons, Inc., L. F., Allentown, Pa.
H P L Manufacturing Co., Cleveland.
Hupp Corporation, Globe Stamping Div., Cleveland.
Kirk & Blum Mfg. Co., Cincinnati.
Lukens Steel Company, Coatesville, Pa.
Maysteel Products, Inc., Milwaukee.
• Miller & Doing, Brooklyn.
• Morrison Products, Inc., Cleveland.
• Morrison Steel Products, Inc., Buffalo.
Moss Industries, Inc., Brooklyn.
• National Metal Fabricators, Chicago.
New Delphos Manufacturing Co., Delphos, O.
New Monarch Machine & Stamping Co., Des Moines, Ia.
Overly Manufacturing Co., Greensburg, Pa.
• Revere Copper & Brass Incorporated, New York City.
Standard Pressed Steel Co., Jenkintown, Pa.
Standard Stamping & Perforating Co., Chicago.
Tannewitz Works, Grand Rapids, Mich.
Truscon Steel Co., Youngstown, O.
• United States Register Co., Battle Creek, Mich.
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.
Worcester Pressed Steel Co., Worcester, Mass.
York Corrugating Co., York, Pa.

STAMPINGS, STEEL FURNACE

Ackermann Manufacturing Company, Wheeling, W. Va.
Commercial Shearing & Stamping Co., Youngstown, O. (Flanged and Dished Heads for Furnace Domes, Radiator Crescent Heads, Hat Pipes).
Mohawk Metal Products Co., Frankfort, N. Y. (furnace shells and radiators).

STEEL FRAMING

See Framing, for Housing Assemblies

STOKER CONTROLS

See Controls, Stoker

STOKER DRIVES

See Drives, Stoker

STOKER SCREWS OR WORMS

See Screws, Feed, Stoker

STOKERS, DOMESTIC

(Up to 61 lb. per hr.)

Advance Appliance Co., Inc., Peoria, Ill.
Allen Stoker Co., Allentown, Pa. (anthracite)
• American Furnace Co., St. Louis.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
• Automatic Firing Corporation, St. Louis.
Bardes Range & Foundry Co., E. H., Cincinnati.
Beckley Perforating Co., Garwood, N. J. (Anthracite).
Black Diamond Stoker Co., Sioux City, Ia.
Bovee Furnace Works, Waterloo, Ia.
Brownell Co., Dayton, O.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
Catskill Metal Works, Inc., Catskill, N. Y. (Anthracite).
Central Rubber & Steel Corp., Findlay, O.
Chicago Automatic Stoker Co., Inc., Chicago.
• Chicago Heat-Master Co., Chicago.
Coal-O-Matic Company, Trucksville, Pa. (Anthracite).
• Conco Engineering Works, Mendota, Ill.
Consolidated Industries, Inc., Lafayette, Ind.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).
• Cotta Transmission Co., Rockford, Ill.
Delco Appliance Div., General Motors Corp., Rochester, N. Y. (Bituminous).
Diamond Iron Works, Inc., Minneapolis.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Eddy Stoker Corp., Chicago.
Electric Furnace-Man, Inc., Emmaus, Pa. (Anthracite).
Excelsior Stove & Mfg. Co., Quincy, Ill.
Fairbanks, Morse & Co., Chicago.
Fire-King Stoker Co., Indianapolis, Ind.
Frederick Iron & Steel, Inc., Frederick, Md. (Anthracite and bituminous).
Freed Heater & Stoker Company, Philadelphia. (Anthracite).
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Gehl Bros. Mfg. Co., West Bend, Wis.
General Machine Co., Inc., Emmaus, Pa. (Anthracite).
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Heating Assurance, Spokane, Wash.
Hemp & Co., Inc., Macomb, Ill.
Heritage Coal & Stoker Co., Chicago.
Hershey Machine & Foundry Co., Manheim, Pa. (Anthracite).
• Hess Warming and Ventilating Co., Chicago.
• Holcomb & Hoke Mfg. Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Illinois Iron & Bolt Co., Chicago.
Iron Fireman Mfg. Co., Cleveland.
Jolly Coker, Inc., Indianapolis. (Coke)
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Keith Furnace Co., Des Moines, Ia.
Kingston Products Corporation, Tipton, Ind.
Kol-Master Corp., Oregon, Ill.
Leas Co., H. Leslie, Monona, Ia.
Link-Belt Co., Chicago.
• Meyer Furnace Co., Peoria, Ill.
Muncie Gear Works, Inc., Muncie, Ind.
National Steam Pump Co., Upper Sandusky, O.
National Stoker Co., Inc., St. Louis (Bit).
Nelson Bros. & Strom Co., Racine, Wis. (Bit)
Northern Steel & Stoker Corp., Peoria, Ill.
Peerless Mfg. Co., Louisville, Ky.
Plymouth Industries, Inc., Plymouth, Ind.
Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
• Rheem Manufacturing Co., New York City.
• Round Oak Co., Dowagiac, Mich.
• Schwab Safe Co., Lafayette, Ind.
Scott-Newcomb, Inc., St. Louis.
Sinker-Davis Co., Indianapolis.
Smith Corporation, A. O., Milwaukee.
Souther Iron Co., E. E., St. Louis.
Steel Products Engineering Co., Springfield, O.
Stewart-Rogers, Inc., Philadelphia (Anthracite).
Stokol Stoker Co., Inc., Indianapolis.
Stoker-Lad Co., Tacoma, Wash.
Sun-Fire Stoker Corp., New Albany, Ind.
Tropic-Air Stoker Co., Canton, O.
U. S. Machine Corporation, Lebanon, Ind.
Viking Manufacturing Corporation, Cleveland.
Whiting Stoker Sales Co., Chicago.
Will-Burt Co., Orrville, O.

STOKERS, INDUSTRIAL AND COMMERCIAL

(61 lb. to 1200 lb. per hr.)

Advance Appliance Co., Inc., Peoria, Ill.
American Coal Burner Co., Chicago, Ill.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
• Automatic Firing Corporation, St. Louis, Mo.
Babcock & Wilcox Co., New York City.
Black Diamond Stoker Co., Sioux City, Ia.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Brownell Co., Dayton, O.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
Catskill Metal Works, Inc., Catskill, N. Y. (Anthracite).
Central Rubber & Steel Corp., Findlay, O.
Chicago Automatic Stoker Co., Inc., Chicago.
Coal-O-Matic Co., Trucksville, Pa. (Anthracite).
Combustion Engineering Co., Inc., New York City.
• Conco Engineering Works, Mendota, Ill.
Consolidated Industries, Inc., Lafayette, Ind.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).
• Cotta Transmission Co., Rockford, Ill.
Crown Iron Works, Minneapolis.
Detroit Stoker Co., Detroit and Monroe, Mich.
Diamond Castings Co., Johnsonburg, Pa.
Diamond Iron Works, Inc., Minneapolis (Ind.)
Eddy Stoker Corp., Chicago.
Electric Furnace-Man, Inc., Emmaus, Pa. (Anthracite)
Fairbanks, Morse & Co., Chicago.
Flynn & Emrich Co., Baltimore.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Gehl Bros. Mfg. Co., West Bend, Wis.
General Machine Co., Inc., Emmaus, Pa. (Anthracite).
General Machinery Co., Spokane, Wash.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Heating Assurance, Spokane, Wash.
Hemp & Co., Inc., Macomb, Ill.
Heritage Coal & Stoker Co., Chicago.
Hershey Machine & Foundry Co., Manheim, Pa. (Anthracite)
Hoffman Combustion Engineering Co., Detroit.
• Holcomb & Hoke Mfg. Co., Indianapolis.
Illinois Iron & Bolt Co., Chicago.
Iron Fireman Mfg. Co., Cleveland.
Kingston Products Corporation, Tipton, Ind.
Kol-Master Corp., Oregon, Ill.
Leas Co., H. Leslie, Monona, Ia.
Link-Belt Co., Chicago.
• Meyer Furnace Co., Peoria, Ill.

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Muncie Gear Works, Inc., Muncie, Ind.
National Steam Pump Co., Upper Sandusky, O.
National Stoker Company, Inc., St. Louis (Blt.)
Nelson Bros. & Strom Co., Racine, Wis. (Blt.)
Newcomb Engineering Co., Grand Rapids, Mich.
Northern Steel & Stoker Corp., Peoria, Ill.
Ormsby-Osterman Co., St. Louis.
Peerless Manufacturing Corporation, Louisville, Ky.
Plymouth Industries, Inc., Plymouth, Ind.
Pocahontas Fuel Co., Inc., Cleveland.
● Rheem Manufacturing Co., New York City.
Rosedale Fdry. & Mach. Co., N. S., Pittsburgh.
● Schwab Safe Co., Lafayette, Ind.
Scott-Newcomb, Inc., St. Louis.
Sinker-Davis Co., Indianapolis.
Steel Products Engineering Co., Springfield, O.
Stokol Stoker Co., Inc., Indianapolis, Ind.
Sun-Fire Stoker Corporation, New Albany, Ind.
Tropic-Air Stoker Co., Canton, O.
U. S. Machine Corporation, Lebanon, Ind.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Whiting Stoker Sales Co., Chicago.
Whitty Company, Inc., Boston, (Bituminous)
Will-Burt Co., Orrville, O.
Woolley Engineering Co., Detroit.

STOVES

See Heaters

STRAINERS, CONDUCTOR

See Fittings and Accessories, Conductor

STRAPS, LEADER

See Fittings and Accessories, Conductor

SWITCHES, MAGNETIC

Allis-Chalmers Mfg. Co., Milwaukee.
Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Automatic Switch Co., New York City.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Company, Rockford, Ill.
Clark Controller Co., Cleveland.
Cutler-Hammer, Inc., Milwaukee.
● Detroit Lubricator Co., Detroit.
Dunn Inc., Struthers, Philadelphia.
Electric Controller & Mfg. Co., Cleveland.
● General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago.
H-B Instrument Co., Inc., Philadelphia.
Hart Mfg. Co., Hartford, Conn. (Mercury Tube).
Industrial Engineering Corp., Terre Haute, Ind.
● McDonnell & Miller, Chicago.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
Monitor Controller Co., Baltimore.
Palmer Electric Co., Chicago.
● Paragon Electric Co., Chicago.
● Penn Electric Switch Co., Goshen, Ind.
Square D Co., Detroit.
Struthers-Dunn, Inc., Philadelphia.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
● White-Rodgers Electric Co., St. Louis.
Zenith Electric Co., Chicago.

SWITCHES, MANUAL

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Cutler-Hammer, Inc., Milwaukee.
Dual Remote Control Co., Wayne, Mich.
Durakool, Inc., Elkhart, Ind. (Mercury).
Electric Controller & Mfg. Co., Cleveland, O.
● General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
Square D Co., Detroit.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

SWITCHES, TIME

Allen-Bradley Company, Milwaukee.
Au-Temp-Co. Corp., New York City.
Automatic Devices Co., Weather Controls Div., Chicago.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Electric Co., Schenectady, N. Y.
● Gleason-Avery, Inc., Auburn, N. Y.
Hansen Mfg. Co., Princeton, Ind. (timing motors and time machines)
Healy Ruff Co., St. Paul, Minn.
Industrial Engineering Corp., Terre Haute, Ind.
International Register Co., Chicago.
Landis & Gyr, Inc., New York City.
● Mercoid Corp., Chicago.
Miller Heat-O-Meter Co., Milwaukee.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
● Paragon Electric Co., Chicago.
● Penn Electric Switch Co., Goshen, Ind.
● Perfex Corp., Milwaukee.
Photoswitch, Inc., Cambridge, Mass.
Reliance Automatic Lighting Co., Racine, Wis.
Reynolds Electric Co., Chicago.
Rhodes, Inc., M. H., Hartford, Conn.
● Sampsel Time Control, Inc., Spring Valley, Ill.
Sangamo Electric Co., Springfield, Ill.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
● White-Rodgers Electric Co., St. Louis.
Zenith Electric Company, Chicago.

TANK HEADS

See Parts for Heating and Air Conditioning Equipment

TEES, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

TEMPERATURE CONTROLS

See Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TIMING MACHINES

See Motors, Timing

TINNING

See Baths, Tinning

TINPLATE

See Sheets, Tin

TIPS, DAMPER

See Clips and Tips, Damper

THERMOMETERS, INDICATING

● Bacharach Industrial Instrument Co., Pittsburgh.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Cooper Oven Thermometer Co., Pequabuck, Conn.
Defender Instrument & Regulator Co., St. Louis.
Dickson Co., Chicago.
Fee & Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York City.
H-B Instrument Co., Inc., Philadelphia.
Illinois Testing Laboratories, Inc., Chicago.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Marsh Corporation, Jas. P., Chicago.
● Marshalltown Manufacturing Co., Marshalltown, Ia.
● Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Company, Chicago (Dial).
Precision Themometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Sarco Company, Inc., New York City.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
United States Gauge, Sellersville, Pa.
Weksler Thermometer Corp., New York City.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Company, Chicago.

THERMOSTATS, DAY AND NIGHT, CLOCK

Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Crown Controls Company, New Bremen, Ohio.
● Detroit Lubricator Co., Detroit.
● General Controls Co., Glendale, Calif.
Master Electric Company, Dayton, Ohio.
● Mercoid Corporation, Chicago.
● Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
● Penn Electric Switch Co., Goshen, Ind.
● Perfex Corp., Milwaukee.
● Sampsel Time Control, Inc., Spring Valley, Ill.
Sarcotherm Controls, Inc., New York City.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
● White-Rodgers Electric Co., St. Louis.

THERMOSTATS, HEAT ACCELERATED OR ANTICIPATING

● Automatic Products Co., Milwaukee.
Au-Temp-Co Corp., New York City.

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Barber-Colman Company, Rockford, Ill.
Barnes & Jones, Inc., Jamaica Plain, Boston.
Crown Controls Company, New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
Friez Instrument Division, Towson, Md.
Fulton Syphon Co., Knoxville, Tenn.
• General Controls Co., Glendale, Calif.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Sarotherm Controls, Inc., New York City.
Tallmadge & Co., Webster, East Orange, N. J.
Thrush & Co., H. A., Peru, Ind.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, LINE VOLTAGE

American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
• Cam-StaT Incorporated, Div. Paul Henry Co., Los Angeles.
• Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal, Incorporated, Ashland, Mass.
Friez Instrument Division, Towson, Md.
• General Controls Co., Glendale, Calif.
H-B Instrument Co., Inc., Philadelphia.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Sarcotherm Controls, Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
Thrush & Co., H. A., Peru, Ind.
United Electric Controls Co., South Boston, Mass.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, LOW VOLTAGE

American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.
• Cam-StaT Incorporated, Div. Paul Henry Co., Los Angeles.
Crise Electric Mfg. Co., Columbus, O.
Crown Controls Company, New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Friez Instrument Division, Towson, Md.
• General Controls Co., Glendale, Calif.
•Gleason-Avery, Inc., Auburn, N. Y.
H-B Instrument Co., Inc., Philadelphia.
McCorkle Co., D. H., Berkeley, Calif.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
• Standard Remote Control Valve Company, South Pasadena, Cal.
Thrush & Co., H. A., Peru, Ind.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, MODULATING OR PROPORTIONING

Atlas Valve Company, Newark, N. J. (Air Operated).
Barber-Colman Company, Rockford, Ill.
Defender Instrument & Regulator Co., St. Louis.
Johnson Service Company, Milwaukee.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Tagliabue Div., C. J., Brooklyn.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Company, St. Louis.

THERMOSTATS, WEATHER COMPENSATING

Automatic Devices Co., Weather Controls Div., Chicago.
Au-Temp-Co Corp., New York City.
Barber-Colman Co., Rockford, Ill.
Detroit Lubricator Co., Detroit.
Heat Timer Corp., New York City.
Illinois Engineering Co., Chicago.
Johnson Service Co., Milwaukee.
Lawler Automatic Controls, Mount Vernon, N. Y.
Marsh Heating Equipment Co., Chicago.
Miller Heat-O-Meter Co., Milwaukee.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Powers Regulator Co., Chicago.
Sarco Co., Inc., New York City.
Sarcotherm Controls, Inc., New York City.
Thrush & Co., H. A., Peru, Ind.
United Electric Controls Co., Boston.
Webster Tallmadge & Co., East Orange, N. J.

THROUGH WALL FLASHINGS

See Flashings, Through Wall

TIME SWITCHES

See Switches, Time

TIMERS, WELDING

Automatic Temperature Control Co., Inc., Philadelphia.
Cutler-Hammer, Inc., Milwaukee.
Electronic Products Co., Geneva, Ill.
Pier Equipment Mfg. Co., Benton Harbor, Mich.
Sciaky Bros., Chicago.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

TIMING MACHINES

See Machines, Timing, for Stoker Controls

TIMING MOTORS

See Motors, Timing

TINNING FLUXES

See Compounds, Tinning

TOGGLE BOLTS

See Bolts, Toggle

TOOLS, METAL WORKERS'

Air-Speed Tool Company, Los Angeles. (Portable Pneumatic Saws)
Akron Steel & Sales, Inc., Akron, Ohio. (Ladder Base, Metal Stretcher, Shrinker, Jogging Blocks, Metal Cutter—Power)
• Barth Mfg. Co., Milldale, Conn.
Berridge Shear Co., Sturgis, Mich. (Pipe Crimpers and Snips)
• Bruno Tools, Beverly Hills, Calif. (Expansive Bit)
C-B Tool Co., Lancaster, Pa. (Rivet Cutter, Drill Savers)
Carboloy Company, Inc., Detroit. (Concrete Drills)
• Champion Tool Co., Los Angeles. (Pipe Crimper)
• Cherry Rivet Co., Los Angeles. (Rivet Gun—Pneumatic and Hand Operated)
Chicago Pneumatic Tool Company, New York City. (Rivet)
Chicago Precision Equipment Co., Chicago, Ill. (Drill Head)
Circo Tool Co., Milwaukee. (Hole Cutters)
Clemson Bros., Inc., Middletown, N. Y.
• Crandall Mfg. Co., Los Angeles. (Drill Grinders)
• Crescent Tool Co., Jamestown, N. Y. (Scratch Awls, Pliers, Pullers, Screw-Drivers)
• Damascus Steel Products Corporation, Rockford, Ill. (Punches, Chisels, Star Drills, Nippers, Drills, Screw Drivers)
Davis & Son Machine Works, Los Angeles. (Clip Punch)
Downs-Smith Brass & Copper Co., Inc., New York City. (Hammers)
Excelsior Tool and Machine Co., East St. Louis, Ill. (Sheet Clamps)
Fairmount Tool & Forging Co., Cleveland. (Caulking Irons, File Holders, Pliers, Solder Paddle, Chisels, Punches, Hammers)
Fearless Tool Co., Los Angeles. (Tool Bit; Rotary Broach; Boring, Turning and Facing Tool)
• Frayn & Co., N. J., Redwood City, Calif. (Hole Cutters)
Greenlee Tool Co., Rockford, Ill. (Pipe Benders, Screw Drivers)
Grobet File Corp. of America, New York City. (Files)
Haines Gauge Company, Inc., Philadelphia. (Thickness Gauges)
Handees Co., Bloomington, Ill. (Truck)
Horst Mehl Mfg. Co., Houston, Texas. (Screw Clamps)
Howes-Woods Co., Cambridge, Mass. (Hack Saw Blades)
Hub Specialty Co., Somerville, Mass. (Awl)
Ideal Industries, Inc., Sycamore, Ill. (Riveting Hammers)
Independent Pneumatic Tool Co., Chicago. (Elec. Screw Drivers, Nut Setters, Tappers)
Interstate Sales Co., New York City. (Angle Meters, Circle Meters, Divizor, Mechanic's Protractor)
Jewel Mfg. Co., St. Paul, Minn. (Welding Clamps)
Johnson, Inc., Wm., Newark, N. J. (Tinners' Rivet Sets)
Johnson Ladder & Shoe Co., Eau Claire, Wis. (Ladder Shoes)
Knu-Vise Incorporated, Detroit. (Vise Wrench)
Lyon Metal Products, Inc., Aurora, Ill. (Stock Cart, Work Bench, Tool Stands)
• Maplewood Machinery Co., Chicago. (Trammel, Marking Tool)
Mid-States Equipment Co., Chicago. (Power Saw)
Millers Falls Co., Greenfield, Mass. (Hack Saws)
Misener Mfg. Co., Inc., Syracuse, N. Y. (Rotary Hack Saw and Blades, and Hole Saw for Metal and Wood)
• Morey, Dan, Los Angeles. (Hammers)
Moser & Son Manufacturing Co., Buffton, Ind. (Spouting Tripods)
Munton Manufacturing Company, Franklin Park, Ill. (Hyd. Vise)
Mutual Liquid Gas & Equipment Co., Inglewood, Calif. (Blow Torch)
Myers Ladder Equipment Company, Madison, Wis. (Ladder Brackets)
New England Carbide Tool Company, Cambridge, Mass. (Drill Bits)
• Niagara Machine & Tool Works, Buffalo.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

Nork Products Co., Los Angeles. (Scribers, Dividers, Calipers, Wiggler)
Packham Crimper Co., Mechanicsburg, O. (Crimping Tongs)
• Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia. (Punches, Chisels and Edge Tools)
Perry Graf Co., Maywood, Ill. (Heat Loss Slide Rule)
Phillips Drill Co., Chicago. (Anchor Bolt Drill)
Pioneer Tool Co., Racine, Wis. (Adj. Saw Handle)
Poe, Ralph W., Canton, Ill. (Sheet Metal Cutters)
• Reiner & Campbell Co., Inc., Elizabeth, N. J. (Dividers)
• Scheck, William, Ridgefield, N. J. (Punches and Scribers)
Scherr Co., Inc., George, New York City. (Micrometers)
• Schild Manufacturing Co., Milwaukee. (Cutter)
Skilsaw, Inc., Chicago. (Portable Saws)
Snap-On Tools Corp., Kenosha, Wis. (Hammers, Screw Drivers, Chisels, Punches, Soldering Irons and Pliers, Hack Saws, Drills, Files, Bolt Cutters, Metal Shears, Tin Snips, Vises, Grinders)
Stanley Tools, New Britain, Conn. (Punches, Rules, Cold Chisels, Levels, Bit Braces, Squares, Screw Drivers, Bars, Hammers)
Stow Manufacturing Co., Binghamton, N. Y. (Flexible Shaft Drills)
Swallow Airplane Co., Wichita, Kansas. (Drivers)
• Topflight Tool Co., Huber Bldg., York, Pa. (Jigs, Riveters, Dimplers, Rivet Removers, Scribing Discs)
• Vital Products Mfg. Co., Cleveland. (Caulking Guns and Cartridges)
Vulcan Electric Co., Danvers, Mass. (Solder Pots, Glue Pots)
Wales-Strippit Corporation, North Tonawanda, N. Y. (Hole Punching and Notching Units)
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill. (Aircraft Rivet Squeezer, Seamer, Hammer, Punches, Rivet Sets, Awls)

TOOLS, ROOFERS'

• Adams Company, Dubuque, Ia. (Scaffold Brackets)
Aeroil Products Company, West New York, N. J. (Melting Kettles, Hoists, Buckets, Tools and Accessories)
Ajax Building Bracket Co., Cleveland Heights, O. (Brackets)
Belden Machine Company, New Haven, Conn. (Hammer, Ripper, Stake and Punch)
Connery Construction Co., Philadelphia. (Kettles)
Eastern States Supply Co., Brooklyn. (Mops, Hoist Wheel, Buckets, Dippers, Slaters' Tools, Tin Discs, Hoisting Hooks)
Elermann Floor Scraper Co., York, Pa. (Roof Scrapers)
• Frey & Co., Frank P., Chicago.
Hauck Manufacturing Co., Brooklyn. (Asphalt and Pitch Kettles)
Littleford Bros., Inc., Cincinnati. (Kettles)
Mohawk Metal Products Co., Frankfort, N. Y. (Kettles)
Moser & Son Manufacturing Co., Bluffton, Ind. (Ladder Jacks)
• Owens-Corning Fiberglas Corporation, Toledo, O. (Fiberglas Mop Yarn)
• Peck, Stow & Wilcox Co., Southington, Conn.
Pioneer Tool Co., Racine, Wis. (Ladder Brackets)
Rose Manufacturing Co., Denver, Colo. (Ladder Shoes)
Southbridge Roofing Company, Inc., Southbridge, Mass. (Scrapers, Gravel Spreaders, Tinners' Firepots, Buckets, Kettles)
Sperry & Co., D. R., Batavia, Ill. (Kettles)
Stortz & Son, Inc., John, Philadelphia. (Tongs, Seamers, Scrapers, Jointers, Punches, Hammers, Rippers, Stakes)
Structural Slate Co., Pen Argyl, Pa. (Hammer, Ripper and Stake, also Portable Machine Cutter and Punch)

TOPS, CHIMNEY

See Caps and Tops, Chimney

TORCHES, BRAZING, CUTTING, WELDING, OXY-ACETYLENE

Aeroil Burner Co., Inc., West New York, N. J.
Air Reduction Sales Co., New York City.
Atkins and Company, Inc., E. C., Indianapolis.
Bastian-Blessing Co., Chicago.
Bernz Co., Otto, Rochester, N. Y. (Brazing)
Black Manufacturing Co., Baltimore, Md.
Burdett Mfg. Co., Chicago.
Dockson Corporation, Detroit.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Manufacturing Co., Philadelphia.
Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Linde Air Products Co., The, New York City.
Marquette Manufacturing Co., Inc., Minneapolis.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Smith Welding Equipment Corp., Minneapolis, Minn.
Trindl Products, Ltd., Chicago.
Universal Welder Corporation, Cleveland.
Wall Chemical Div., Liquid Carbonic Corp., Chicago.

TORCHES, SOLDERING

Acet-A-Tips Company, Chicago.
Bastian-Blessing Co., Chicago.
Bernz Co., Otto, Rochester, N. Y.
• Clayton & Lambert Mfg. Co., Louisville, Ky.
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Everhot Mfg. Co., Maywood, Ill.
Harris Calorific Co., Cleveland.
Ideal Industries, Inc., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago.
Insto-Gas Corporation, Detroit.
• Johnson Gas Appliance Co., Cedar Rapids, Ia.
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Ransome Company, Emeryville, Calif.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Cedar Rapids, Ia.
Sanders, J. A., Fulton, N. Y.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago. (Gasoline, Kerosene)
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.

TRANSFORMERS, IGNITION

Davis & Co., Inc., Dean W., Chicago.
Dongan Electric Manufacturing Co., Detroit.
General Electric Co., Schenectady, N. Y.
Harvey, Inc., Sid., Valley Stream, N. Y.
Jefferson Electric Company, Bellwood, Ill.
• Webster Electric Co., Racine, Wis.

TRANSFORMERS, LOW VOLTAGE

• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.
Davis & Co., Inc., Dean W., Chicago.
• Detroit Lubricator Co., Detroit.
Dongan Electric Mfg. Co., Detroit.
• General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Jefferson Electric Co., Bellwood, Ill.
Master Electric Company, Dayton, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sterling Electric Motors, Inc., Los Angeles.
Taylor-Winfield Corp., Warren, O.
Wagner Electric Corp., St. Louis.
• Webster Electric Co., Racine, Wis.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

TRANSMISSIONS, VARIABLE SPEED

Allis-Chalmers Mfg. Co., Milwaukee.
Ideal Industries, Inc., Sycamore, Ill.
Lewellen Mfg. Co., Columbus, Ind.
Link-Belt Company, Chicago.
Stephens-Adamson Mfg. Co., Aurora, Ill.

TRIM, ORNAMENTAL

See Moulding and Trim, Ornamental

TUBING, ALUMINUM

Aluminum Company of America, Pittsburgh.
Lewin-Mathes, Lewin Metals Div., St. Louis.
• Revere Copper & Brass, Incorporated, New York City.
Reynolds Metals Company, Louisville, Ky.

TUBING, COPPER

Allegheny-Ludlum Steel Corporation, Pittsburgh. (Stainless)
• American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
• Hussey & Co., C. G., Pittsburgh.
Lewin-Mathes Company, Lewin Metals Div., St. Louis.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., British American Tube Div., New York City.
• Revere Copper & Brass Incorporated, New York City.
Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.

TUBING AND FITTINGS, PLASTIC

Acadia Synthetic Products Division, Chicago.
American Hard Rubber Co., New York City.
Commercial Plastics Co., Chicago.
Extruded Plastics, Inc., Norwalk, Conn.
Firestone Tire & Rubber Co., Akron, O.
General Electric Co., Pittsfield, Mass.
Goodrich Co., B. F., Akron, O.
Irvington Varnish and Insulator Co., Irvington, N. J.

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Resistoflex Corp., Belleville, N. J. (Synthetic)
• Skuttle Manufacturing Co., Detroit.
United States Stoneware Co., Akron, O., and New York City.
Yardley Plastics Company, Columbus, O.

UNITS, AIR CONDITIONING

See Air Conditioning Units

UNITS, FUEL FOR OIL BURNERS

See Pumps, Fuel Oil

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Manufacturing Co., Chicago.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Ilg Electric Ventilating Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Meier Electric & Machine Co., Indianapolis, Ind.
Mellish & Murray Co., Chicago.
Reed Unit-Fans, Inc., New Orleans.
Somers, Inc., H. J., Detroit.
Sturtevant Company, B. F., Div. Westinghouse Electric, Hyde Park, Mass.
• Trade-Wind Motorfans, Inc., Los Angeles.
Unified Air Conditioner Co., Duluth, Minn.
Utility Appliance Corporation, Los Angeles.

VACUUM CLEANERS FOR FURNACES

See Cleaners, Vacuum, Furnace

VALVES, GAS PRESSURE REGULATING

Atlas Valve Co., Newark, N. J.
• Barber Gas Burner Co., Cleveland.
Davis Regulator Co., Chicago.
Defender Instrument & Regulator Co., St. Louis. (Chronometer)
Detroit Gas Regulator Co., Detroit.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Fulton Syphon Co., Knoxville, Tenn.
• General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.
Harris Calorific Co., Cleveland.
Hotstream Heater Co., Cleveland.
Mason-Neilan Regulator Co., Boston.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Morse, Smith & Morse, Inc., Watertown, Mass.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Denver, Colo.
Payne Furnace Co., Beverly Hills, Calif.
Pittsburgh Equitable Meter Div., Rockwell Mfg. Co., Pittsburgh.
Reliance Regulator Corporation, Alhambra, Calif.
Reynolds Gas Regulator Co., Anderson, Ind.
Roberts-Gordon Appliance Corp., Buffalo.
Security Valve Company, Los Angeles.
• Standard Remote Control Valve Company, South Pasadena, Calif.
• Thermac Co., Los Angeles.
Voss Co., J. H. H., New York City.

VALVES, HUMIDIFIER, WATER LEVEL

Beckett & Co., Thomas, Dallas, Texas.
Fisher Governor Co., Marshalltown, Ia.
• General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.
• Maid-O'-Mist, Inc., Chicago.
• McDonnell & Miller, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Morey, Dan, Los Angeles.
Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
• Skuttle Manufacturing Co., Detroit.
• Viking Air Conditioning Corp., Cleveland.

VALVES, SADDLE

See Fittings, Humidifier, Water Level

VALVES, SOLENOID

Alco Valve Co., St. Louis.
Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Automatic Switch Co., New York City.
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee.
Davis Regulator Co., Chicago.
• Detroit Lubricator Co., Detroit.
Electrimatic Division, The Simoniz Co., Chicago.
• General Controls Co., Glendale, Calif. (Magnetic)
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hubbell Corp., Chicago.
Keckley Co., O. C., Chicago, Ill.
• McDonnell & Miller, Chicago.
• Mercoid Corp., Chicago.
Milwaukee Gas Specialty Company, Milwaukee.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Payne Furnace Co., Inc., Beverly Hills, Calif.
• Penn Electric Switch Co., Goshen, Ind.
Pfening Co., Fred D., Columbus, O.
R-S Products Corporation, Philadelphia.
Ruggles-Klingemann Mfg. Co., Salem, Mass.
Sarco Co., Inc., New York City.
Sarcotherm Controls, Inc., New York City.
Sciaky Bros., Inc., Chicago.
• Silver Flame, Inc., Detroit.
Sporlan Valve Co., St. Louis.
Square D Company, Detroit.
Supreme Electric Products Corp., Rochester, N. Y.

VANES FOR AIR CONTROL, INSIDE DUCTS

• Air Devices, Inc., New York City.
• Anemostat Corporation of America, New York City. (Equalizing Deflectors)
Barber-Colman Company, Rockford, Ill.
Register & Grille Manufacturing Co., Inc., Brooklyn.
• Tuttle & Bailey, Inc., New Britain, Conn.
• Waterloo Register Company, Waterloo, Ia.

VENTILATORS, CEILING

Airmaster Corp., Chicago.
• Auer Register Co., Cleveland.
Barber-Colman Company, Rockford, Ill.
Best Register Co., Milwaukee.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Decatur Iron & Steel Co., Decatur, Ala.
• Elgo Shutter & Manufacturing Co., Detroit.
Gillian Mfg. Co., Detroit.
• Hart & Cooley Mfg. Co., Holland, Mich.
Klauer Manufacturing Co., Dubuque, Ia.
• Milcor Steel Co., Milwaukee.
• Miller & Doing, Brooklyn.
• Pryne & Co., Inc., Los Angeles.
• Tuttle & Bailey, Inc., New Britain, Conn.
Universal Blower Co., Birmingham, Mich.
• United States Register Co., Battle Creek, Mich.

VENTILATORS, MUSHROOM

Aeolus Dickinson, Chicago.
Best Register Co., Milwaukee.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Knowles Mushroom Ventilator Co., Montclair, N. J.
Lumm Co., A. H., Toledo, O.
• Mueller Furnace Co., L. J., Milwaukee.
Penn Ventilating Co., Philadelphia.

VENTILATORS, ROOF, FAN

Aeolus Dickinson, Chicago.
Aerovent Fan Co., Piqua, O.
• Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
Aladdin Heating Corporation, Oakland, Calif.
Allen Corp., Detroit. (Turbine)
American Blower Corporation, Detroit.
American Coolair Corp., Jacksonville, Fla.
American-Larson Ventilating Co., Pittsburgh.
American Steel Band Co., Pittsburgh.
Arex Co., Chicago.
Belanger Fan & Blower Co., Detroit.
• Bishop & Babcock Mfg. Co., Cleveland.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilating Co., New York City. (Turbine)
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Chicago Fan & Fin Coil Co., Chicago.
Clay Equipment Corp., Cedar Falls, Ia.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Diehl Mfg. Company, Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Electrovent Fan & Mfg. Co., Chicago.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
• Gallaher Company, Owatonna, Minn. (Centrifugal)
Gehri Company, Tacoma, Wash.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Howes-Woods Company, Cambridge, Mass.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
Kernchen Co., Chicago.
King Co., Owatonna, Minn.
Klauer Manufacturing Co., Dubuque, Ia.
Klee Co., George B., Cincinnati.
Lee & Son Co., Thomas, Cincinnati.
Lumm Co., A. H., Toledo, O.
Martin Fan & Blower Co., Chicago.
Mellish & Murray Co., Chicago.
Mountain States Equipment Co., Denver, Colo.
Myers Electric Co., Pittsburgh.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

● National Metal Fabricators, Chicago.
Nationalaire Corporation, Detroit.
Nelson Corporation, Herman, Moline, Ill.
Newcomb Engineering Co., Grand Rapids, Mich.
New York Blower Co., Chicago.
Overly Manufacturing Co., Greensburg, Pa.
Pennsylvania Wire Glass Co., Philadelphia.
Peerless Electric Co., Warren, O.
Penn Ventilating Co., Philadelphia.
Pennsylvania Wire Glass Co., Philadelphia. (round accelerator).
Powermatic Ventilator Co., Cleveland.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans.
Robertson Co., H. H., Pittsburgh. (Round-Rectangular)
Royal-Apex Mfg. Corporation, Brooklyn. (Turbine and Stationary).
Royal Ventilator Co., Philadelphia.
Shreveport Engineering Co., Inc., Shreveport, La.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Somers, Inc., H. J., Detroit.
● Swartwout Co., Cleveland.
● Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, LaCrosse, Wis.
Truflo Fan Co., Harmony, Pa.
Uno Ventilator Co., Cliftondale, Mass. (Turbine)
Utility Appliance Corporation, Los Angeles.
Van Noorden Company, E., Boston.
● Viking Air Conditioning Corp., Cleveland.
Waverly Heating Supply Co., Boston.
● Western Engineering & Mfg. Co., Los Angeles.
Wind-Way Fan & Ventilator Co., New Orleans.
Wing Mfg. Co., L. J., New York City.
Winkler & Sons, Inc., A. E., Milwaukee.
Young Radiator Company, Racine, Wis.

VENTILATORS, ROOF, GRAVITY

● Accurate Mfg. Works, Chicago.
● A-J Manufacturing Co., Kansas City, Mo.
● Ajax Furnace Fitting Co. Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Aeolus Dickinson, Chicago.
● Air Control Products, Inc., Coopersville, Mich.
● Air-Devices, Inc., New York City.
Allen Corp., Detroit. (Turbine)
American-Larson Ventilating Co., Pittsburgh.
● American Metal Products, Fort Worth, Tex.
American Steel Band Co., Pittsburgh.
Appleton Supply Co., Appleton, Wis. (Roof Slant Louvres)
Arex Co., Chicago.
Autoforce Ventilating System, Boston.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Clay Equipment Corp., Cedar Falls, Ia.
● Clayton & Lambert Mfg. Co., Middletown, Ohio.
Day Co., The, Minneapolis.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
Firecraft Corporation, Chicago.
Gehri Company, Tacoma, Wash.
● Gelert Company, C. R., Pasadena, Cal.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Howes-Woods Company, Cambridge, Mass.
International Steel Co., Evansville, Ind.
Iona Ventilator Co., Inc., Philadelphia.
Iwan Brothers, South Bend, Ind.
Jamar Co., Walker, Duluth, Minn.
Jordan & Co., Paul R., Indianapolis.
Kernchen Co., Chicago.
King Co., Owatonna, Minn.
Klauer Manufacturing Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lee & Son Co., Thomas, Cincinnati.
Lumm Co., A. H., Toledo, O.
Martin Fan & Blower Co., Chicago.
Matt Coil-Less Burner Co., Chicago.
Mellish & Murray Co., Chicago.
● Milcor Steel Co., Milwaukee.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Nationalaire Corporation, Detroit.
Newcomb Engineering Co., Grand Rapids, Mich.
Overly Manufacturing Co., Greensburg, Pa.
Penn Ventilating Co., Philadelphia.
● Protected Steel Products, Washington, Pa.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H., Pittsburgh. (Monitor)
Royal-Apex Mfg. Corp., Brooklyn, N. Y. (turbine, revolving)
Royal Ventilator Co., Philadelphia.
St. Paul Corrugating Co., St. Paul, Minn.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Souther Iron Co., E. E., St. Louis.
Standard Furnace & Supply Company, Omaha, Nebr.
Standard Ventilator Co., Lewisburg, Pa. (Rotary)
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
● Swartwout Co., Cleveland.
Tierney Rotor Ventilator Co., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Uno Ventilator Co., Cliftondale, Mass. (Turbine)
Vallas, Lionel, Chicago.
Van Noorden Company, E., Boston.
● Western Engineering & Mfg. Co., Los Angeles.
● Willis Steel Corporation, Galesburg, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.

VENTILATORS, ROOF, RIDGE

● Accurate Mfg. Works, Chicago.
Aeolus Dickinson, Chicago.
American-Larson Ventilating Co., Pittsburgh.
American Steel Band Co., Pittsburgh.
Arex Co., Chicago.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Firecraft Corporation, Chicago.
Gehri Company, Tacoma, Wash.
● Gelert Company, C. R., Pasadena, Cal.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Klauer Manufacturing Co., Dubuque, Ia.
Nationalaire Corporation, Detroit.
Overly Manufacturing Co., Greensburg, Pa.
Pennsylvania Wire Glass Co., Philadelphia.
Penn Ventilating Co., Philadelphia.
● Protected Steel Products, Washington, Pa.
Robinson Company, H. H., Pittsburgh.
Royal Ventilator Co., Philadelphia.
Souther Iron Co., E. E., St. Louis.
● Swartwout Co., Cleveland.
Van Noorden Company, E., Boston.

VIBRATION ISOLATERS

See Bases and Pads

WARM AIR REGISTER SHIELDS

See Shields, Warm Air Register

WASHERS, AIR, HEATING AND VENTILATING

(Capacity 4,000 c.f.m. and up)

Air & Refrigeration Corp., New York City.
Airwasher Corporation, Eaton Rapids, Mich.
● Alton Manufacturing Co., Dallas, Tex.
American Blower Corp., Detroit.
● Bayley Blower Co., Milwaukee.
● Bishop & Babcock Mfg. Co., Cleveland.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Carrier Corporation, Syracuse, N. Y.
Centri-Spray Co., Detroit.
● Clarage Fan Co., Kalamazoo, Mich.
Columbus Heating & Ventilating Co., Columbus, O.
● Furblo Company, Hermansville, Mich.
Ice Air Conditioning Co., Inc., Brooklyn.
Mellish & Murray Co., Chicago.
Mountain States Equipment Co., Denver, Colo.
Murray Manufacturing Co., D. J., Wausau, Wis.
New York Blower Co., Chicago.
Northern Blower Co., Cleveland.
Peters-Dalton, Inc., Detroit.
Schmieg Industries, Detroit.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Trane Co., La Crosse, Wis.
● U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
Vilter Mfg. Company, Milwaukee.
Western Blower Co., Seattle, Wash.
York Corp., York, Pa.

WATERPROOFING

Angier Corporation, Framingham, Mass.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Cabot, Inc., Samuel, Boston.
Carey Mfg. Co., Philip, Lockland, O.
Cheesman-Elliot Co., Inc., Brooklyn, N. Y.
Flintkote Co., New York City.
Glidden Company, Cleveland.
Henderson & Co., Peter, New York City. (coating)
Horn Co., Inc., A. C., Long Island City, N. Y.
Johns-Manville Sales Corp., New York City.
Koppers Company, Inc., Pittsburgh.
Lehon Company, Chicago.
Nebel Manufacturing Co., Cleveland.
Reilly Tar & Chemical Corporation, Indianapolis, Ind. (Compounds)
Ruberoid Co., New York City.
Sisalkraft Co., Chicago.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Truscon Laboratories, Detroit.
X-Pando Corporation, Long Island City, N. Y.

WATER HEATERS

See Coils, Fire Pot, Hot Water

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

WELDERS, ARC

Air Reduction Sales Company, New York City.
Allis-Chalmers Manufacturing Company, Milwaukee.
Borm Manufacturing Company, Elgin, Ill.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Ergolyte Mfg. Co., Philadelphia. (A.C.)
• Fern, Ralph, Scranton, Pa.
General Electric Co., Schenectady, N. Y.
Glenn-Roberts Company, Oakland, Calif.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hampton Electric Mfg. Co., Pittsburgh.
Harnischfeger Corp., Milwaukee. (Electric)
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Hobart Brothers Co., Troy, O.
Hollup Corp., Div. National Cylinder Gas Co., Chicago.
Ideal Electric & Mfg. Co., Mansfield, O.
Larkin Lectro Products Co., New York City.
Lee Co., K. O., Aberdeen, S. D.
• Lincoln Electric Co., Cleveland.
Marquette Manufacturing Co., Inc., Minneapolis. (A.C.)
Mid-States Equipment Co., Chicago.
Miller Electric Mfg. Co., Inc., Appleton, Wis. (Portable)
National Cylinder Gas Co., Chicago.
Nelson Specialty Welding Equipment Corp., San Leandro, Calif. (Stud welder)
Sight Feed Generator Co., Richmond, Ind.
Smith Corporation, A. O., Milwaukee.
Smith Welding Equipment Corp., Minneapolis.
Trindl Products, Ltd., Chicago.
Universal Welder Corporation, Cleveland.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A.C.)

WELDERS, PROJECTION

• Acme Electric Welder Co., Los Angeles.
Agnew Electric Company, Milford, Mich.
National Electric Welding Machines Co., Bay City, Mich.
Pier Equipment Mfg. Co., Benton Harbor, Mich.
Precision Welder and Machine Co., Cincinnati.
Progressive Welder Company, Detroit.
Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit.
Taylor-Winfield Corporation, Warren, O.
Thomson Electric Welder Company, Lynn, Mass.
Welding Machines Mfg. Co., Detroit.

WELDERS, RESISTANCE

(Flash and Butt)

• Acme Electric Welder Company, Los Angeles.
Agnew Electric Company, Milford, Mich.
Expert Welding Machine Company, Detroit.
National Electric Welding Machines Co., Bay City, Mich.
Precision Welder and Machine Co., Cincinnati.
Progressive Welder Company, Detroit.
Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit.
Taylor-Winfield Corporation, Warren, O.
Thomson Electric Welder Company, Lynn, Mass.
Universal Welder Corporation, Cleveland.

WELDERS, SEAM

Agnew Electric Company, Milford, Mich.
National Electric Welding Machines Co., Bay City, Mich.
Progressive Welder Company, Detroit.
Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit.
Thomson Electric Welder Company, Lynn, Mass.
Universal Welder Corporation, Cleveland.
Welding Machines Mfg. Co., Detroit.

WELDERS, SPOT

• Acme Electric Welder Co., Los Angeles.
Agnew Electric Co., Milford, Mich.
Alphil Spot Welding Co., Brooklyn.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Federal Machine & Welder Co., Warren, O.
• Fern, Ralph, Scranton, Pa.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Larkin Lectro Products Co., New York City.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
Micro Products Co., Chicago.
National Electric Welding Machines Co., Bay City, Mich.
Pier Equipment Manufacturing Co., Benton Harbor, Mich. (Foot operated and motor driven)
Precision Welder and Machine Co., Cincinnati.
Progressive Welder Company, Detroit.
Rex Welder and Engineering Co., Kansas City, Mo.
Sciaky Bros., Chicago, Ill.
Swift Electric Welder Co., Detroit.
Taylor-Hall Welding Corp., Warren, Ohio.
Taylor-Winfield Corp., Warren, O. (Butt and Seam)
Thomson Electric Welder Company, Lynn, Mass.
Universal Welder Corporation, Cleveland.
Weldex, Inc., Detroit.
Welding Machines Mfg. Co., Detroit.
Westinghouse Electric Corporation, East Pittsburgh.

WELDING COMPOUNDS

See Compounds, Welding

WELDING ROD

See Rod, Welding

WELDING TORCHES

See Torches, Brazing, Cutting, Welding

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.
• Air Controls, Inc., Cleveland.
Atlas Heating and Ventilating Co., Ltd., San Francisco.
• Bayley Blower Co., Milwaukee.
• Bishop & Babcock Mfg. Co., Cleveland.
• Burden Company, Los Angeles.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Products, Inc., Irvington, N. J.
• Clarage Fan Co., Kalamazoo, Mich.
Goettl Bros., Phoenix, Ariz.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Mfg. Co., Hastings, Nebr.
Janette Mfg. Co., Chicago.
Johnson Fan & Blower Corporation, Chicago.
• Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago.
Mayne Products Co., Dayton, O.
• Morrison Products, Inc., Cleveland.
New York Blower Co., Chicago.
• Peerless Electric Co., Warren, O.
• Schwitzer-Cummins Company, Indianapolis.
Sturtevant Co., B. F., Div. Westinghouse Electric, Hyde Park, Mass.
Torrington Mfg. Co., Torrington, Conn.
Trane Company, La Crosse, Wis.
• Triangle Mfg. Co., Oshkosh, Wis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Company, Seattle, Wash.

WINDOW FANS

See Fans, Window

WINDOWS, HEAT INSULATING

Andersen Corp., Bayport, Minn.
Chamberlin Company of America, Detroit.
Detroit Steel Products Co., Detroit.
Libbey-Owens-Ford Glass Co., Toledo, O.
Pittsburgh Plate Glass Co., Pittsburgh.
Russell Co., F. C., Cleveland.
Truscon Steel Co., Youngstown, O.

WINDOWS, METAL, HOLLOW OR EXTRUDED

Biersach & Neidermeyer Co., Milwaukee.
Edwards Manufacturing Co., Cincinnati.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Jamestown Metal Corp., Jamestown, N. Y.
Newman Brothers, Inc., Cincinnati.
Perkinson & Brown, Chicago.
Russell Co., F. C., Cleveland.
Truscon Steel Co., Youngstown, O.
Vallas, Lionel, Chicago.
Watco Engineering, Inc., Cleveland.
• Willis Steel Corporation, Galesburg, Ill.

WIRE GLASS

See Glass, Wire

WIRE, PLAIN, GALVANIZED AND COPPERED

Allegheny Ludlum Steel Corp., Pittsburgh. (Stainless)
Aluminum Co. of America, Pittsburgh. (Aluminum)
American Nickeloid Co., Peru, Ill. (Chrome, nickel coated)
• American Rolling Mill Company, Middletown, Ohio. (Stainless)
American Steel & Wire Co., Cleveland.
Berger Mfg. Div. Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized)
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Coppered)
Columbia Steel Co., San Francisco.
• Continental Steel Corp., Kokomo, Ind. (Plain galvanized steel)
Copperweld Steel Co., Glassport, Pa.
• Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh. (Galvanized)
Laclede Steel Co., St. Louis.
Page Steel & Wire Div., Monessen, Pa.
• Republic Steel Corp., Cleveland. (Steel)
Roebling's Sons Co., John A., Trenton, N. J.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp., Buffalo.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRING MACHINES

See Machines, Wiring

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

Section of

American Artisan

1947 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 2 - TRADE NAMES]

A

AAF—Air Filters, American Air Filter Co., Inc., Louisville, Ky.
ABC—Blower-Washer Units. American Blower Corp., Detroit.
ABC—Air Conditioning Furnaces, Water Heaters, Oil Burners. Automatic Burner Corp., Chicago, Ill.
ABC—Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.
ACB—Metal Protecting Paint. Tropical Paint & Oil Co., Cleveland.
A/C—Washable Filters. American Air Filter Co., Inc., Louisville, Ky.
AGM—Space and Water Heaters. American Gas Machine Co., Albert Lea, Minn.
AM—Solder. Alpha Metals, Inc., Brooklyn.
AMS—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
A-P — Heat Regulators, Thermostats, Solenoids. Automatic Products Co., Milwaukee, Wis.
A-P Dependable—Controls. Automatic Products Company, Milwaukee.
A.R.A.—Asbestos Return Air Sheets. Grant Wilson, Inc., Chicago.
ASBO — Ventilators. American Steel Band Co., Pittsburgh.
ate — Timers. Automatic Temperature Control Co., Inc., Philadelphia.
"A. W."—Plates and Sheets. Alan Wood Steel Co., Conshohocken, Pa.
Abrasoweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Ace—Hammers and Mallets. Dan Morey, Los Angeles.
Ace—Welders, Welding Timers. Pier Equipment Mfg. Co., Benton Harbor, Mich.
Ace—Damper Regulators. Martens & Stormoen, Boston.
Acid-Proof—Insulating Cement. Quigley Company, New York City.
Acidseal—Paints and Coatings. B. F. Goodrich Co., Akron, O.
Acme—Ozone Apparatus. A & J Co., Chicago.
Acmeloy — Electrodes. Acme Electric Welder Co., Los Angeles.
Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Activ-Air—Air Conditioning Furnaces. Heil Co., Milwaukee, Wis.
Activ-Flame—Oil Burners. Heil Co., Milwaukee, Wis.
Adacast—Refractories. Botfield Refractories Co., Philadelphia.
Adamant—Insulating Cement. Botfield Refractories Co., Philadelphia.
Adapatch — Refractories. Botfield Refractories Company, Philadelphia, Pa.
Ada-Stic—Insulating Cement. Botfield Refractories Co., Philadelphia, Pa.
Aeracool—Fan Blades, Fans, Louvres and Shutters, Ventilators. Myers Electric Co., Pittsburgh, Pa.
Aerisweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Aerofuse—Air Diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
Aerolux—A. C. Furnaces. S. T. Johnson Co., Oakland, Calif.
Aeropel—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.
Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
Aeroplex—Blowers. Bayley Blower Co., Milwaukee, Wis.
Aeropull—Ventilators. Paul R. Jordan & Co., Inc., Indianapolis, Ind.
Afco—Blowers, Blower - Filters, Furnaces and Stokers. American Furnace Co., St. Louis, Mo.
Afco "Duo Blo"—Furnaces. American Furnace Co., St. Louis, Mo.
Afco Master-Gas—Furnaces. American Furnace Co., St. Louis, Mo.
Affco — Grilles, Louvres. American Foundry & Furnace Co., Bloomington, Ill.
Agile—Welding Electrodes. American Agile Corp., Cleveland.
Agitair—Air Diffusers, Baffles, Filters, Water Heaters, Vanes, Ventilators, Air Devices Inc., New York City.
Airaconstic — Insulation. Johns - Manville, New York City.
Airate—Ventilators. Aeolus Dickinson, Chicago.
Airboy—Blower Filter. The Peerless Electric Co., Warren, Ohio.
Aircell — Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Air-Champ—Evaporative Coolers, Attic Fans, Air Washers. Alton Manufacturing Co., Dallas, Tex.
Airco — Electrodes, Soldering Flux, Welding Rod, Torches and Welding Equipment. Air Reduction Sales Co., New York City.
Air-Con—Heating & Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Air Control—Air Conditioning Units, Bearings, Blowers, Blower-Filters, Blower Housings and Wheels. Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Aircor—Wire Cloth Filters. Air Filter Corporation, Milwaukee.
Air-Dryette Jr.—Dehumidifiers. Solvey Sales Corporation, New York City.
Aire-Flo—Furnaces. Lennox Furnace Co., Marshalltown, Ia.
Air-Flo—Motor Operated Louvers. Air Conditioning Products Co., Detroit.
Aire-RAY-ator — Furnaces. Ray Oil Burner Co., San Francisco.
Airex—Air Conditioning Units, Blowers, Fans, Washers, Mountain States Equipment Co., Denver, Colo.
Airflo—Pipe, Fittings and Accessories. Milcor Steel Co., Milwaukee.
Airflo — Furnaces. Aladdin Heating Corp., Oakland, Calif.
Air Flow — Blowers, Fans, Blower Wheels. Goettl Bros., Phoenix, Ariz.
Airfoil—Axial Flow Fans. Thermo-Aire Div., Evans Products Co., Plymouth, Mich.
Airfoil—Fans and Fan Blades, Ventilators. Aerovent Fan Co., Piqua, O.
Airguide—Hygrometers and Thermometers, Fee & Stemwedel, Inc., Chicago, Ill.
Air Horse—Pneumatic Hammer, Grinder, Rotary File. Ideal Industries, Inc., Sycamore, Ill.
Airidge — Ridge Ventilators. Aeolus Dickinson, Chicago.
Airistocrat — Fan Blades. Torrington Mfg. Co., Torrington, Conn.
Airjector—Ventilators. Swartwout Co., Cleveland.
Airjet—Roof Ventilators and Vent Flue Caps. C. R. Gelert Company, Pasadena, Calif.
Air-Lift — Blowers and Fans. Mauer Engineering, Evanston, Ill.
Airline—Registers & Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
Air-Lock — Gas Conversion Burners. Reinhard Brothers Co., Minneapolis.
Airmat—Dust Collectors, Filters, American Air Filter Co., Inc., Louisville, Ky.
Airmixt—Gas Burners. F. C. Williams, Inc., Detroit.
Airmover—Blowers. Skuttle Mfg. Co., Detroit.
Airmover — Ventilators. Swartwout Company, Cleveland, O.
Air-O-Matic — Air Conditioning Units. Williams Oil - O - Matic Division, Bloomington, Ill.
Airo-Flex—Directional Flow Registers. Auer Register Co., Cleveland.
Airotor — Blower Wheels. Torrington Mfg. Co., Torrington, Conn.
Air-Seel—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.
Airstat — Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.
Airstream — Blower Wheels. Morrison Products, Inc., Cleveland.
Airtopia — Air Conditioning Units. Drayer-Hanson, Inc., Los Angeles.
Airtrol—Blower-Filters, Attic Fans. Air Control Products, Inc., Coopersville, Mich.
Air-Turn—Vanes. Barber-Colman Co., Rockford, Ill.
Air Valve—Ventilators. Swartwout Co., Cleveland.
Air-Van — Roof Ventilators. Gallaher Co., Owatonna, Minn.
Air-Vane—Registers. Rock Island Register Co., Rock Island, Ill.
Air-Vent—Roofing Felt. Ruberoid Co., New York.
Air Wave—Ventilating Fans. Trade-Wind Motorfans, Inc., Los Angeles.
Airway—Louvers and Ventilators. Firecraft Corporation, Chicago.
Air-X-Hauster—Ventilators. G. C. Breidert Co., Los Angeles.
Akron Air Blast—Furnaces. May-Fiebeger Co., Newark, Ohio.
AkTiv — Cleaning Compound. Turco Products, Inc., Los Angeles.
Albron — Aluminum Paint. Aluminum Company of America, Pittsburgh.
Alclad—Sheets. Aluminum Company of America, Pittsburgh.
Alco—Ventilators. A. H. Lumm Co., Toledo, Ohio.
Alcon—Aluminum Products. Aluminum Co. of America, Pittsburgh, Pa.
Alkacite—Paint. Protective Coating, Incorporated, Detroit.
All-Alloy — Shears. Bremil Mfg. Co., Erie, Pa.
Allan—Water Heaters. John Wood Mfg. Co., Inc., Conshohocken, Pa.
Allegheny Metal — Stainless. Allegeny Ludlum Steel Corporation, Pittsburgh.
Allen-Flux—Soldering Flux. L. B. Allen Co., Inc., Chicago.
Allerton—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
All-Sol—Flux. L. B. Allen Co., Chicago.
Alltite — Insulation. Coast Insulating Corp., Los Angeles.

All-Weather — Roof Cement, Caulking Compounds, Roofing Paint. Ford Roofing Products Company, Chicago.

Alma — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Almar—Hand Slitting Machines. Ward Machinery Co., Chicago, Ill.

Alnor—Thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Alodine—Aluminum surface treatment. American Chemical Paint Co., Ambler, Pa.

Alumbrite — Paint. Thompson & Co., Pittsburgh, Pa.

Alumi-Flux—Soldering Flux. L. B. Allen Co., Chicago, Ill.

Aluminized — Clad Sheets. American Rolling Mill Co., Middletown, Ohio.

Alumin-nu — Metal Cleaner. NuSteel Company, Chicago.

Alumi-Soder—Aluminum Solder. L. B. Allen Co., Chicago.

Aluminweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Always Reliable—Soldering Furnaces, Mallets, Torches. Otto Bernz Co., Rochester, N. Y.

Amazon—Water Heaters. Mustee Heater Co., Cleveland.

Ameo—Flux. American Solder & Flux Co., Philadelphia, Pa.

Amerform—Combustion Chambers, Refractories. Commonwealth Products Co., Philadelphia.

American—Water Heaters. Hotstream Heater Co., Cleveland.

American DeLuxe—Gas Burners. American Htg. & Eng. Co., New Albany, Ind.

Ameri-therm—Air Conditioners. American Thermal Industries, Detroit.

Amerock—Cabinet and Casing Hardware. American Cabinet Hardware Corp., Rockford, Ill.

Aminco—Anemometers. American Instrument Co., Silver Spring, Md.

Ampac—Welders. Allis-Chalmers Mfg. Co., Milwaukee.

Am-Pe-Co—Blowers. American Machine Products Co., Marshalltown, Ia.

Amplifire—Gas Burner. Surface Combustion, Toledo, Ohio.

Anaconda—Copper and Brass Products. American Brass Co., Waterbury, Conn.

Anchor—Evaporative Coolers, Furnaces. W. H. Stewart Company, Oklahoma City.

Anchor — Hangers. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Anchor Brand—Rivets. Townsend Co., New Brighton, Pa.

Anchor Brand—Soldering Flux, Garden City Laboratory, Inc., Chicago.

Anchor-Kolstoker — Stoker-fired Furnaces and Stokers. Anchor Stove & Range Co., New Albany, Ind.

Anchortite — Nails. Dickson Weatherproof Nail Co., Evanston, Ill.

Anderson—Spray Nozzles. B. F. Sturtevant Co., Hyde Park, Mass.

Anemo-Light — Diffusers. Anemostat Corporation of America, New York City.

Anti-Pluvius — Skylights. Hirschman-Pohl Co., Inc., LeRoy, N. Y.

Antoxide—Metal Protecting Paint. DuPont de Nemours & Company, Wilmington, Del.

Apartvent—Window Ventilating Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

Apex—Furnaces. Excelsior Steel Furnace Co., Chicago.

Apex—Quadrants. Ohio Products Co., Cleveland, Ohio.

Apex—Hangers, Elbows and Fittings. Royal-Apex Mfg. Co., Brooklyn.

Apex Exl-Air — Furnaces. Excelsior Steel Furnace Co., Chicago.

Apolloy — Copper Steel. Apollo Steel Company, Apollo, Pa.

Appton Super — Pneumatic Hammer. Brown-Appton Company, New York City.

Aqua Bar—Roof Cement. Continental Products Co., Euclid, O.

Aquadam—Roof Cement. Blue Ridge Talc Co., Inc., Henry, Va.

Aqua-Master—Water Heaters. Century Eng. Corp., Cedar Rapids, Ia.

Aqua-Scale—Automatic Humidifier. J. P. Glasby Mfg. Co., Bloomfield, N. J.

Aqua-Therm — Water heaters. Norge Heat Div., Borg-Warner Corp., Detroit.

Aquatherm—Water Heaters. H. C. Little Burner Co., Inc., San Rafael, Calif.

Aquella—Waterproofing. Peter Henderson & Co., New York City.

Aqulux—Water Heaters. S. T. Johnson Co., Oakland, Calif.

Arc-Eng—Air Conditioning Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

ArcoFlame—Oil Burners. American Rad. & Standard Sanitary Corp., Pittsburgh, Pa.

Arctic—Air Conditioning Units. Premier Furnace Co., Dowagiac, Mich.

Arctic Aire—Kitchen Exhaust Fans. F. A. Smith Mfg. Co., Rochester, N. Y.

Arctic Circle — Evaporative Coolers. Goettl Bros., Phoenix, Ariz.

Arctic Circle—Evaporative Coolers. International Metal Products Company, Phoenix, Ariz.

Ardmore—Water Heaters. John Wood Mfg. Co., Inc., Conshohocken, Pa.

Arex-Austor—Ventilators. Arex Company, Chicago.

Arin Accelerant—Louvers and Shutters. Arex Co., Chicago.

Arin Stationary—Louvers and Shutters. Arex Co., Chicago.

Arlington—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.

Armco—Plates, Sheets. American Rolling Mill Co., Middletown, O.

Armco Ingot Iron—Roofing and Sheets. American Rolling Mill Co., Middletown, O.

Armorize—Paint. Carter Paint Co., Liberty, Ind.

Armstrong—Compressors. General Machinery Co., Spokane, Wash.

Arrow Gas—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Arrowhead — Water Heaters. Rheem Mfg. Co., New York City.

Arrowtrol — Heating and Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Arteraft—Blowers and Furnaces. Chicago Steel Furnace Co., Chicago, Ill.

Artisan—Flux. American Solder & Flux Co., Philadelphia, Pa.

Asbestocel—Furnace Insulation. Johns-Manville, New York City.

Asbestocite—Duct Board, Johns-Manville, New York City.

Asbo—Ventilators. American Steel Band Co., Pittsburgh.

Asco—Relays, Switches, Valves. Automatic Switch Co., New York, N. Y.

At-A-Glance—Oil Gauge. Krueger Sentry Gauge Company, Green Bay, Wis.

Ath-A-Nor — Furnaces. May-Fiebeger Co., Newark, Ohio.

Atlas—Blowers, Furnaces. International Sales Co., San Francisco.

Attievane—Attic Fans. B. F. Sturtevant Co., Boston.

Auto—Humidifier Valves. Maid-O'-Mist, Inc., Chicago.

Autocrat—Fan Blades. Torrington Mfg. Co., Torrington, Conn.

Autocrat—Oil Burners. Chandler Company, Cedar Rapids, Iowa.

Automat—Gas Conversion Burner. National Engineering & Manufacturing Co., Kansas City, Mo.

Automatic—Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Autostart—Buffers. U. S. Electrical Motors, Inc., Los Angeles.

Aviation—Snips. Penn Tool Co., Philadelphia.

Axiflo — Fans. B. F. Sturtevant Co., Boston.

B

BB—Blast Gates, Roof Clips, Damper Clips and Tips, Conductor Fittings and Accessories, Snow Guards, Berger Brothers Company, Philadelphia.

B & B — Louvers & Shutters, Blower Wheels. Bishop & Babcock Mfg. Co., Cleveland.

B. F. C.—Gas Burners. Moncrief Furnace & Mfg. Co., Dallas, Tex.

B-H—Insulating Cement. Baldwin-Hill Co., Trenton, N. J.

B & W—Refractories & Stokers. Babcock & Wilcox Co., New York City.

Baco — Refractories. Bird Archer Co., Philadelphia.

Badger—Time Switches, Reliance Automatic Lighting Co., Racine, Wis.

Baers—Enamels, Lacquers and Paint. Baer Brothers, New York City.

Baffle Mix—Refractories. Walsh Refractories Corp., St. Louis.

Balloffet—Nozzles. Delavan Engineering Co., Des Moines, Ia.

Balsam - Wool — Flexible Insulation. Wood Conversion Co., St. Paul.

Bankheat—Oil Burners. S. T. Johnson Co., Oakland, Calif.

Banner — Refractories. Chicago Fire Brick Co., Chicago.

Bantam — Motors. Small Motors, Inc., Chicago.

Bantam—Shear. Lincoln Machine Co., Boston.

Bantam Bully—Air Hammer. Superior Manufacturing Co., Cleveland.

Bar-Brook—Fans, Ventilators. Shreveport Eng. Co., Inc., Shreveport, La.

Bar-Ox—Rust Inhibitor. Truscon Laboratories, Detroit.

Barreled Sunlight—Paint and Enamel. U. S. Gutta Percha Paint Co., Providence, R. I.

Bar-Rust — Metal Protecting Paint. Midland Paint & Varnish Co., Cleveland.

Barry—Pillow Blocks, Pulleys. R. & J. Dick Co., Inc., Passaic, N. J.

Barthel — Soldering Furnaces and Torches. J. A. Sanders, Fulton, N. Y.

Basmor — Air Conditioning Furnace. Bastian-Morley Co., Inc., LaPorte, Ind.

Beckett—Gas Burners. Horsman-Markin Corp., Detroit.

Beckett Commodore—Oil Burners. R. W. Beckett Eng. Co., Elyria, O.

Belair — Water Heaters. Hollywood Water Heater Co., Glendale, Calif.

Beloit — Machines, Punches, Tools. Hendley & Whittemore Co., Beloit, Wis.

Bemis — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Benda-Vane — Registers. Rock Island Register Co., Rock Island, Ill.

Bend - Ezy — Grilles and Registers. Standard Stamping & Perforating Co., Chicago.

Berloy — Building Products. Berger Mfg. Co., Div. Republic Steel Corp., Canton, Ohio.

Best—Cast Iron Chimney Caps. Sterling Foundry Co., Sterling, Ill.

Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.

Bethlehem Doe—Oil Burners. Bethlehem Fdy. & Mach. Co., Bethlehem, Pa.

Bettendorf—Oil Burners. Lennox Furnace Co., Marshalltown, Iowa.

Better-Bilt—Furnaces. Barnes Heating & Ventilating Co., Long Beach, Cal.

Bifurcator—Blowers. DeBothezat Fans Div., East Moline, Ill.

Bildrite—Sheathing. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis.

Billy Penn—Sheet Metal Products. Penn Supply & Metal Corporation, Philadelphia.

Biltwel—Furnaces. Fraser & Johnston Co., San Francisco.

BI-MIX—Gas Burners. John Zink Co., Tulsa, Okla.

Bitumastic Black Solution — Paint. Wailes Dove-Hermiston Corp., Westfield, N. J.

Bitumastic 70 B—Enamel. Wailes Dove-Hermiston Corp., Westfield, N. J.

Bituseal—Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Black Diamond—Built-up Roofing. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Black Diamond — Furnaces. Maple City Furnace Co., Monmouth, Ill.

Black Diamond—Stokers. Beckley Perforating Co., Garwood, N. J.

Blo-Aire — Blower-Filter Units. Meyer Furnace Co., Peoria, Ill.
Blo-Fan—Fans and Ventilators. Pryne & Co., Los Angeles.
Bloflex—Flexible Hose. American Ventilating Hose Co., New York City.
Blowertrol — Thermostatic Hydraulic Control. White Mfg. Co., St. Paul.
Blowette — Blower-Filter Units. Lau Blower Co., Dayton, Ohio.
Bluebird—Snips. Bergman Tool Mfg. Co., Buffalo.
Blue Flame—Gas Conversion Burners. Consolidated Industries, Inc., Lafayette, Ind.
Blue Flame—Rotary Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.
Blue Knight—Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Blue-Point — Drills, Tools. Snap-on Tools Corp., Kenosha, Wis.
Blue Ridge—Wire Glass. Libbey-Owens-Ford Glass Co., Toledo, Ohio.
BNCO — Metal Windows, Doors, Skylights, Welding and Sheet Metal Work. Biersach & Neidermeyer Co., Milwaukee, Wis.
Bob-Cat—Electric Hoist. Lisbon Hoist & Crane Co., Lisbon, O.
Bonderizing—Metal processes. Parker Rust-Proof Co., Detroit.
Boomer—Furnaces, Heaters. Hess-Snyder Co., Massilon, O.
Boost-Aire—Fans. L. J. Mueller Furnace Co., Milwaukee.
Booster—Water Heaters. Lawson Mfg. Co., Pittsburgh.
Bradford — Water Heaters. Pennsylvania Range Boiler Co., Philadelphia.
Branford—Oil Burners. Malleable Iron Fittings Co., Branford, Conn.
Brazare—Electrodes. Universal Welder Corporation, Cleveland.
Brazo—Bronze Soldering Flux. Linde Air Products Co., New York City.
Breez-Air—Fans. Buffalo Forge Co., Buffalo, N. Y.
Breese Hydroxilating—Oil Burners. Oil Devices, Chicago.
Breezo—Kitchen Exhaust Fans. Buffalo Forge Co., Buffalo, N. Y.
Brevokrak—Crackle Finish Paint. Zapon Div., Atlas Powder Co., North Chicago, Ill.
Brick-mix—Plastic Refractory. Chicago Fire Brick Co., Chicago.
Brilliant—Aluminum enamel. Calbar Paint & Varnish Co., Philadelphia.
BronzoChroms—Gas Welding Rod. Eutectic Welding Alloys Corporation, New York City.
Bronzend — Electrodes. Arcos Corp., Philadelphia.
Brownie—Water Heaters. Brown Steel Tank Co., Minneapolis.
Brownskin—Waterproof Sheathing Paper. Angier Corp., Framingham, Mass.
Budget—Water Heaters. American Radiator & Standard Sanitary Corp., Pittsburgh.
Bull Dog—Snips and Shears. Wiss & Sons Co., Newark, N. J.
Bulldog—Shear. Lincoln Machine Co., Boston.
Bunker Hill—Roofing, Sheets and Solder. Northwest Lead Co., Seattle, Wash.
Bu-Pro-Fire—Furnaces, Heaters. Tennessee Enamel Mfg. Co., Nashville, Tenn.
Burner-Set—Castable Refractory. Plibrico Jointless Firebrick Co., Chicago.
Butler—Stokers. Whiting Stoker Sales Co., Chicago.
But-N-tite—Steel Roofing. St. Paul Corrugating Co., St. Paul.
Buzzer — Gas Soldering Furnaces. Charles A. Hones, Inc., Baldwin, N. Y.

C

CDC—Bearings, Couplings, Pulleys. Chicago Die Casting Company, Chicago.
C-H — Relays, Switches and Valves. Cutler-Hammer, Inc., Milwaukee, Wis.
C.H.F.S.Co. — Fittings & Accessories. Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
C & L—Soldering Furnaces and Torches. Clayton & Lambert Mfg. Co., Dearborn, Mich.
C J B—Bearings. Ahlberg Bearing Co., Chicago.
C.M.W.—Stokers. Catskill Metal Works, Catskill, N. Y.
C.M.W. Hot Water Maker—Stoker-Fired Water Heater. Catskill Metal Works, Inc., Catskill, N. Y.
CP—Electric Tools. Chicago Pneumatic Tool Co., New York City.
C-10 — High Temperature Paint. Laclede-Christy Clay Products Co., St. Louis.
California—Water Heaters. W. B. Bastian Mfg. Co., Los Angeles.
Calktite — Caulking Compounds. U. S. Stoneware Co., Akron, Ohio.
Calorie—Furnaces. Marshall Furnace Co., Marshall, Mich.
Capillary—Air Conditioning Units, Filters, Washers. Air & Refrigeration Corp., New York City.
Capital—Furnaces. Farris Furnace Co., Springfield, Ill.
Capitol Rock Wool—Insulation. Standard Lime & Stone Co., Baltimore.
Capitolaire — Furnaces. United States Radiator Corp., Detroit.
Cara-Flux No. 400—Flux solution. Carajob Chemical Co., Inc., Fremont, Mich.
Carbonaire—Oil Burners. Aldrich Co., Wyoming, Ill.
Carburetor-Stoker—Industrial Stokers. Wooley Eng. Co., Detroit.
Cardolite—Caulking Compound. Irvington Varnish & Insulator Co., Irvington, N. J.
Carend—Electrodes. Arcos Corp., Philadelphia.
Careyclad — Metal Protecting Paint. Philip Carey Mfg. Co., Lockland, O.
Careyduct — Prefabricated Ducts and Fittings. Philip Carey Co., Lockland, Ohio.
Carter—Oil Burners. General Oil Heating Corp., West New York, N. J.
Castalu—Blower Wheels and Fans. Advance Aluminum Castings Corp., Chicago, Ill.
Castirnare — Electrodes. Universal Welder Corp., Cleveland.
Cast-Iron-Arc — Electrodes. Universal Welder Corporation, Cleveland.
Cast-Refract — Baffles. Quigley Company, Inc., New York City.
Caulk-N-Seal — Caulking Compound. Blue Ridge Talc Co., Inc., Henry, Va.
Caulk-O-Seal — Caulking and Glazing Compounds. Calbar Paint & Varnish Co., Philadelphia, Pa.
Cauxeal—Compounds, X-Pando Corporation, Long Island City, N. Y.
Ce-Co—Caulking Compounds & Paints. Cheesman - Elliot Company, Inc., Brooklyn.
Cecotite — Roofing Paint. Cheesman-Elliot Company, Inc., Brooklyn.
Cello-Sponge—Evaporators. Viking Air Conditioning Corp., Cleveland.
Cell-U-Blanket — Insulation. Masonite Corp., Chicago.
Cellufoam—Duct Insulation. Masonite Corporation, Chicago.
Cementkote—Paint. Tropical Paint & Oil Co., Cleveland, O.
Cemesto—Duct Boards. Celotex Corporation, Chicago.
Center-Finder — Protractor. Interstate Sales Co., New York City.
Centerflo—Industrial Fans. Holden Fan Co., Detroit.
Centri-Merge—Dust Collectors. Schmieg Industries, Inc., Detroit.
Centripeller—Ventilating Fans. Paul R. Jordan & Co., Inc., Indianapolis.
Cerny—Band Saw. Ermac Company, Los Angeles.
Challenger — Domestic Stokers. Link Belt Co., Chicago.
Challenger—Circulating Gas Heaters. Independence Stove & Furnace Co., Independence, Mo.
Challenger—Stokers. Kol-Master Corp., Oregon, Ill.
Chamberlin — Automatic Humidifier. Chandler Co., Cedar Rapids, Ia.
Champion — Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.
Champion — Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Checker Coat—Sheets. Continental Steel Corp., Kokomo, Ind.
Cheerfulator — Space Heaters. Adams Bros. Mfg. Co., Inc., Pittsburgh.
Chernack—Retractable Duct. Wiremold Company, Hartford, Conn.
Chicago—Brakes and Presses. Dreis & Krump Mfg. Co., Chicago, Ill.
Chicago—Stokers. Eddy Stoker Corporation, Chicago.
Chicago-Wrigley—Toggle and Anchor bolts. Chicago Expansion Bolt Co., Chicago.
Chico Brikset—High Temperature Cement. Chicago Fire Brick Co., Chicago, Ill.
Chieftain—Refrigerating Compressors. Tecumseh Products Co., Tecumseh, Mich.
Chinook—Heating Coils. Bayley Blower Co., Milwaukee, Wis.
Chinookfin — Heating Coils. Bayley Blower Co., Milwaukee, Wis.
Chlorend — Electrodes. Arcos Corp., Philadelphia.
Chore Boy — Conversion Gas Burner. Standard Fuel Engineering Co., Detroit.
Chromend — Electrodes. Arcos Corporation, Philadelphia.
Chromeweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Chromtrim — Light Weight Shapes, Mouldings, Trim. R. D. Werner Co., Inc., New York City.
Chronat—Furnace and Boiler Repairs. National Fdry. & Furnace Co., Dayton, O.
Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Chrysler-Airtemp—Heating and Cooling Equipment. Airtemp Div., Chrysler Corp., Dayton, Ohio.
Cibulas—Puttyless Skylights. General Sheet Metal Works, Inc., Bridgeport, Conn.
Cinch—Expansion Bolts. National Lead Co., New York City.
Cinkote—Paint. Blue Ridge Talc Co., Inc., Henry, Va.
Circle T—Switches. Trumbull Electric Mfg. Co., Plainville, Conn.
Circo—Louvers & Shutters. Circulators & Devices Mfg. Corp., New York City.
CirCOOLator — Fans and Ventilators. Viking Air Conditioning Corporation, Cleveland, O.
Circulaire—Heaters. J. V. Patten Co., Sycamore, Ill.
Circu-Ray—Furnaces and Heaters. Tennessee Enamel Mfg. Co., Nashville, Tenn.
Clason—Snow Guards. M. N. Cartier & Sons Company, Providence, R. I.
Class 60 — Fuel Oil Pumps. Kraissl Company, Inc., Hackensack, N. J.
Classic—Heating & Ventilating Registers. Auer Register Co., Cleveland, O.
Cleanaire — Blower - Filters. Peerless Foundry Co., Indianapolis, Ind.
Cleveland — Burners, Furnaces. Dornback Furnace & Fdy. Co., Cleveland.
Cliffdale—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Clifton—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Climate - Changer — Air Conditioning Units. Trane Co., La Crosse, Wis.
Climate Master—Oil Burning Air Conditioning Furnace. Hess Warming & Ventilating Co., Chicago, Ill.
Climatrol — Blower-Filter Units. Furnaces. L. J. Mueller Furnace Co., Milwaukee.
Clincher—Conductor Fittings and Accessories. Milcor Steel Co., Milwaukee.
Clipper—Furnaces. Henderson Furnace & Mfg. Co., Sebastopol, Calif.
Clipper—Kitchen Exhaust Fans. Trade-Wind Motorfans, Inc., Los Angeles.
Colawelding — Flux. Technical Processes Div., Colonial Alloys Co., Philadelphia.
Colbrazing—Flux. Technical Processes Div., Colonial Alloys Co., Philadelphia.

Coldstream — Air Conditioning Units. Baker Ice Machine Company, Inc., Omaha, Nebr.
Cole — Draft Governor. Cole - Sewell Engineering Co., Minneapolis.
Coliopakes — Roofing Paint. Samuel Cabot, Inc., Boston.
Colonial — Blower-Filters, Oil Burners, Furnaces, Humidifiers, Heaters, Stokers. Green Colonial Furnace Co., Des Moines, Ia.
Colonial — Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn.
Columbia—Ventilators. E. E. Souther Iron Co., St. Louis.
Columbus—Humidifiers. Fred D. Pfening Co., Columbus, Ohio.
Combustioneer — Stokers. Steel Products Engineering Co., Springfield, O.
Comet—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.
Comet—Hoists. Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Comet Exhaustair—Fans and Ventilators. New York Blower Co., Chicago, Ill.
Comfort — Furnaces. May - Fiebeger Company, Newark, Ohio.
Comfort-Aire—Gas Burners. Chas. M. Olmstead & Co., Detroit.
Comfortaire—Furnaces. Hammel Radiator Engineering Co., Los Angeles.
Comfortmaker—Furnaces. Joliet Heating Corp., Joliet, Ill.
Commander—Furnaces. Peerless Foundry Co., Indianapolis, Ind.
Co-Min-Co—Insulating Cement. United States Mineral Wool Co., Chicago.
Compact—Blowers. Bishop & Babcock Mfg. Co., Cleveland, O.
Compact—Oil Burners. The Aldrich Co., Wyoming, Ill.
Conco-Heat—Furnaces. Conco Engineering Works, Mendota, Ill.
Condor—Belts. Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.
Coni-Vane — Ventilators. Allen Corp., Detroit.
Conservoil—Oil Burners. Crane Company, Chicago.
Consolaire—Circulating Heaters. Hammel Radiator Eng. Co., Los Angeles.
Conterflow—Air Conditioning Furnaces. Western Blower Co., Seattle.
Control-O-Gas—Valves. Payne Furnace Co., Beverly Hills, Calif.
Controlaire—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.
Convector — Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.
Convector — Humidifiers. Maid-O'-Mist, Inc., Chicago.
Convert — Gas Burners. Columbia Burner Company, Toledo, Ohio.
Coolair—Fans and Ventilators. American Coolair Corp., Jacksonville, Fla.
Coolero—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Cooper Silver Seal — Floor Furnaces. John Zink Co., Tulsa, Okla.
Copper-Fabric—Flashing. Wasco Flashing Co., Cambridge, Mass.
Copperior—Sheets. Superior Sheet Steel Co., Canton, O.
Copperseal—Flashing. Wasco Flashing Co., Cambridge, Mass.
Copperskin—Waterproof sheathing paper. Angier Corp., Framingham, Mass.
Cop - R - Loy — Copper Bearing Steel Sheets, Wheeling Steel Corp., Wheeling, W. Va.
Cop-R-Tex—Thru-Wall Flashing. Wasco Flashing Co., Cambridge, Mass.
Co-Res-Co — Coatings, Caulking Compounds, Lacquers, Metal Protecting Paint. Cordo Chemical Corp., Norwalk, Conn.
Corinco — Insulation. Cork Insulation Co., Inc., New York, N. Y.
Corkboard — Insulation. Armstrong Cork Co., Lancaster, Pa.
Corozene—Ozone Apparatus. Coroaire Heater Corp., Cleveland.
Corvette — Water Heaters. Security Manufacturing Co., Kansas City, Mo.
Cottrell Process — Collectors. Western Precipitation Corp., Los Angeles.
Cozy—Furnaces. Advance Furnace Co., Wichita, Kans.
Crane Basmor—Furnaces. Bastian-Morley Co., Inc., LaPorte, Ind.
Crary's—Cut-Offs. Galvan Manufacturing Co., New Albany, Ind.
Crescent — Furnaces. Green Colonial Furnace Co., Des Moines, Ia.
Crescent—Oil Burners. Caloroil Burner Corp., Hartford, Conn.
Crescent — Furnaces. Crane Company, Chicago.
Crest — Water Heaters. Day & Night Mfg. Co., Monrovia, Calif.
Crestoloy—Tools. Crescent Tool Co., Jamestown, N. Y.
Cromaloy — Stainless Soldering Flux. Linde Air Products Co., New York City.
Crown Heat King — Gas Conversion Burner. B. G. B. Manufacturing Company, Dearborn, Mich.
Crucibleweld—Arc Welding Electrodes. Westinghouse Electric & Mfg. Co., East Pittsburgh.
Crusader—Oil Burners. Bethlehem Fdry. & Mach. Co., Bethlehem, Pa.
Crystal—Crackle Finish Paint. Hilo Varnish Corp., Brooklyn.
Custom-Aire—Furnaces and Heaters. Heating Equipment Co., San Francisco.
Cycloidal—Furnaces. Excelsior Stove & Mfg. Co., Quincy, Ill.
Cyclone—Hoists. Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cyclone—Drill-bits. New England Carbide Tool Co., Cambridge, Mass.

D

D & D—Hole Cutter. N. J. Frayn Company, Redwood City, Calif.
DFC—Refractory. Denver Fire Clay Co., Denver, Colo.
Dampertrol—Controls. Hotstream Heater Co., Cleveland.
Dana—Fans, Fume Exhausters, Louvres, Ventilators. Geo. B. Klee Co., Cincinnati.
Da - Nite — Acratherm. Minneapolis-Honeywell Reg. Co., Minneapolis.
Daptobiu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis.
Dasco—Punches, Tools. Damascus Steel Products Corporation, Rockford, Ill.
Dayton Thorobred — V-Belts. Dayton Rubber Mfg. Co., Dayton, Ohio.
Day-Steel — Pulleys. Dayton Rubber Mfg. Co., Dayton, Ohio.
Deco-Shingles — Metal Shingles. Ajax Furnace Fitting Co., Div. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Decoseal—Paints. Debevoise Co., Brooklyn.
Defender—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.
Deflecto—Ventilators. The Day Co., Minneapolis, Minn.
Deflectrol—Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.
Degraco—Enamels, Lacquers & Paints. Detroit Graphite Co., Detroit.
Dehydrantine — Waterproofing. A. C. Horn Co., Inc., Long Island City.
Delon — Time Switches. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Delco - Heat — Oil Burners, Furnaces, Motors and Stokers. Delco Appliance Div., General Motors Corp., Rochester, N. Y.
DeLuxe — Air Conditioning Furnaces. Williamson Heater Co., Cincinnati.
DeLuxe—Gravity Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.
DeLuxe—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
DeLuxe—Heaters and Water Heaters. Evans Products Co., Detroit.
DeLuxe—Water Heaters. Lawson Mfg. Co., Pittsburgh.
Deoxidine — Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.
Dependable—Paint. Heath & Milligan Mfg. Co., Chicago, Ill.
Dereka—Paint. Debevoise Co., Brooklyn, N. Y.
De-Sta-Co — Blower Housings and Stampings. Detroit Stamping Co., Detroit.
Detroit LoStoker — Stokers. Detroit Stoker Co., Detroit.
Detroit RotoStoker—Overfeed Spreader Stoker. Detroit Stoker Co., Detroit.
Detroit UniStoker — Stokers. Detroit Stoker Co., Detroit.
DeVulcan—Gas Burners. National Burner & Mfg. Co., Detroit.
Dexter Heat Valve—Ridge Ventilators. Swartwout Co., Cleveland.
Dial — Damper Regulator. Martens & Stormoen, Boston.
Dial-Set — Stokers. Kol-Master Corp., Oregon, Ill.
Diamond—Enamels, Lacquers. Thompson & Co., Pittsburgh, Pa.
Diamond—Smoke Pipe Dampers. Adams Company, The, Dubuque, Ia.
Diamond—Water Heaters. A. Y. McDonald Mfg. Co., Dubuque, Ia.
Diamond H—Controls, Relays, Switches. Hart Mfg. Co., Hartford, Conn.
Di-Arco — Precision Machines. O'Neil-Irwin Mfg. Co., Minneapolis.
Dickinson—Ventilators. Aeolus Dickinson, Chicago, Ill.
Dickrope—V-type Belts. R. & J. Dick Co., Passaic, N. J.
Di-Mol—Saws. Henry Disston & Sons, Inc., Philadelphia.
Directaire—Air Conditioning Furnaces. Fitzgibbons Boiler Co., Inc., New York City.
Directrol—Duct Turning Vanes. Register & Grille Mfg. Co., Inc., Brooklyn.
Dixie — Water Heaters. Hotstream Heater Co., Cleveland.
Dixie Bell—Water Heaters. Hotstream Heater Co., Cleveland.
Dixie Star—Water Heaters. Hotstream Heater Co., Cleveland.
Do-All—Hammer. Wodack Electric Tool Corp., Chicago.
Dorex—Odor Adsorbers. W. B. Connor Eng. Corp., New York City.
Double Diamond — Humidistats, Psychrometers, Relays, Switches, Thermometers. H-B Instrument Company, Philadelphia, Pa.
Double-Duty—Oil Burners. Aldrich Co., Wyoming, Ill.
Double-Seal—Humidifier Fittings. Hays Mfg. Co., Erie, Pa.
Dover-Imperial—Eaves Trough Hangers. Ohio Wire Products Co., Dover, Ohio.
DovRloy—Sheets. Reeves Steel & Mfg. Co., Dover, Ohio.
Dowmetal — Plates and sheets. Dow Chemical Company, Midland, Mich.
Draft-A-Justor — Barometric Dampers. Preferred Utilities Mfg. Corp., New York City.
Draft KoreKtor—Damper. Cole-Sewell Engineering Co., Minneapolis.
Draftender — Motors and Regulators. Penn Electric Switch Co., Goshen, Ind.
Draft-O-Stat — Draft Regulators and Smoke Pipe Dampers. Hotstream Heater Company, Cleveland.
Draftrite—Draft Gages. Bacharach Industrial Instrument Co., Pittsburgh.
Dri-Air—Dehumidifiers. Tamms Silica Company, Chicago.
Drifilter—Filters. American Air Filter Co., Inc., Louisville, Ky.
Dri-Lap—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
Dri-N-Tite—Cement. A. C. Horn Co., Inc., Long Island City, N. Y.
Driwal—Waterproofing Compound. The Glidden Co., Cleveland.
Drou-ve-lite — Skylights. Hirschman-Pohl Co., Inc., LeRoy, N. Y.
Dual-Clone—Blow Pipe Collectors. Day Co., Minneapolis.
Dubbiseal — Sheeting. Masonite Corp., Chicago.
Duco—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.
Ducon — Controls, Soldering Coppers, Dual Remote Control Co., Wayne, Mich.
Ductboard—Prefabricated Ducts. Sail Mountain Co., Chicago.
Duct Soundliner — Duct Insulation. Baldwin-Hill Company, Trenton, N. J.

Ducturns—Vanes. Tuttle & Bailey, Inc., New Britain, Conn.
Ductype — Blowers. South Bend Air Products, Inc., South Bend, Ind.
Dukrome—Metal Protecting Paint, du-Pont de Nemours & Co., Wilmington, Del.
Dul-Kote—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Dulux—Enamels, Lacquers and Paints. E. I. du Pont de Nemours & Co., Wilmington, Del.
Duo-Lock—Pittsburgh Lock Formers. Riverside Machinery Co., Chicago.
Duplate—Safety Glass. Pittsburgh Plate Glass Co., Pittsburgh.
Duplex—Flashings. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Dura—Furnaces, Heaters. Barry Furnace Co., Hamilton, O.
DuraBilt — Gravity Registers. Auer Register Co., Cleveland, Ohio.
Duraclad—Water Heaters. A. O. Smith Corporation, Milwaukee.
Dura-Flex—Directional Flow Registers. Auer Register Co., Cleveland.
Duraflex—Stokers. Canton Stoker Corp., Canton, Ohio.
Dura-Line—Heating & Ventilating Registers. Auer Register Co., Cleveland.
Duralite — Refractory. Chicago Fire Brick Co., Chicago.
Dura-Sheen — Flues and Roof Jacks. Baltimore Enamel and Novelty Co., Baltimore.
Duronze—Plates and Sheets. Bridgeport Brass Co., Bridgeport, Conn.
Dust Arrester—Dust and Lint Collectors. American Air Filter Co., Inc., Louisville.
DustStop — Filters. Owens - Corning Fiberglas Corp., Toledo, Ohio.
Dust-Trap — Filters. Morf Industries, Staten Island, N. Y.
Dutch Boy—Paint and Solder. National Lead Co., New York City.
Dux-Sulation — Duct Insulation. Grant Wilson, Inc., Chicago, Ill.
Dynaflow — Blowers and Fans. South Bend Air Products, Inc., South Bend, Ind.
Dynetric — Balancing Equipment. Gisholt Machine Co., Madison, Wis.
Dyno-Mite — Electric Drills. Millers Falls Co., Greenfield, Mass.

E

EM—Motors. Electric Machinery Mfg. Co., Minneapolis.
E-Z Arc—Arc Welders. Will-Weld Mfg. Co., Omaha, Nebr.
Eagle Mineral Wool—Insulation. Eagle Picher Co., Cincinnati, O.
Eagle Star — Solder. Eagle-Picher Co., Cincinnati.
Eagle Super—Insulating Cement and Flashing. Eagle-Picher Co., Cincinnati, Ohio.
Eagle Super "66"—Furnace Insulation. Eagle-Picher Co., Cincinnati, O.
Eagle Supertemp — Duct Insulation. Eagle-Picher Co., Cincinnati, O.
Easternoil—Oil Burners. Eastern Oil & Equipment Co., Portland, Me.
Easy Bend—Eaves Trough and Gutters. St. Paul Corrugating Co., St. Paul, Minn.
Easy-Flo—Solder. Handy & Harman, New York, N. Y.
Easy - Slip — Conductor Pipe, Eaves Trough and Gutters. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Easyweld — Electrodes. Universal Welder Corporation, Cleveland, O.
E. C. Cord—V-Belts. Goodyear Tire & Rubber Co., Inc., Akron, O.
Echo—Ceiling Ventilators. Elgo Shutter & Mfg. Co., Detroit, Mich.
Econocol—Stokers, Cotta Transmission Corporation, Rockford, Ill.
Economy—Power Hack Saws. F. L. Robertson, Buffalo, N. Y.
Economy—Furnaces, Heaters. International Heater Co., Utica, N. Y.
Economy—Gas Burners. H-P Products, Akron, O.
Economy — Adjustable Buffing Hoods. Kirk & Blum Mfg. Co., Cincinnati, O.
Economy—Ventilators. Arex Company, Chicago, Ill.
Economy — Squaring Shears. Acme Equipment Co., Inc., Chicago.
Economy—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.
Edge Seal—Filters. Wilson & Co., Inc., Chicago, Ill.
Effico — Louvres, Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Effico Louver—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
80—FWA—Utility Room Furnace. Fitzgibbons Boiler Co., Inc., New York N. Y.
Elasticon—Roofing Paint. A. C. Horn Co., Inc., Long Island City, L. I., N. Y.
Elastikote—Paint. Tropical Paint & Oil Co., Cleveland, O.
El-Bow—Roof Ventilators. Trade-Wind Motorfans, Inc., Los Angeles.
Electric City — Gutter Forming Machines. F. L. Robertson, Buffalo, N. Y.
Electric Furnace—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.
Electric Furnace Man—Domestic Stoker. General Machine Co., Inc., Emmaus, Pa.
Electric Janitor—Controls and Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Electric Piston—Draft Regulators. Hotstream Heater Co., Cleveland.
Electro-Airmat—Filters. American Air Filter Co., Inc., Louisville, Ky.
Electro - Cell — Filters. American Air Filter Co., Inc., Louisville, Ky.
Electrolaire — Air Conditioning Furnaces. Electrol Mfg. Co., Rutherford, N. J.
Electro-Matic — Filters. American Air Filter Co., Inc., Louisville, Ky.
Electro-Mist—Oil Mist and Smoke Collector. American Air Filter Co., Inc., Louisville, Ky.
Electronic Tornado—Arc Welders. Lincoln Electric Co., Cleveland, O.
Electro-Sheet—Roofing. American Brass Co., Waterbury, Conn.
Electro-Valve—Solenoid Valves. Sciaky Bros., Inc., Chicago.
Electro-Wind—Ventilators. Allen Corp., Detroit, Mich.
Elgin — Pneumatic Hammers, Brazing Torches and Welders. Borm Mfg. Co., Elgin, Ill.
Elgin — Louvers and Shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.
Elite — Gravity Registers. Auer Register Co., Cleveland, Ohio.
Elsco — Motors. Electric Sprayit Co., Sheboygan, Wis.
Elvanayre—Gas Burners. J. E. Van Tuyl & Associates, Cleveland.
EMCO—Gas Pressure Regulators. Pittsburgh Equitable Meter Div., Rockwell Mfg. Co., Pittsburgh.
Emerson, Jr. — Emerson Electric Mfg. Co., St. Louis, Mo.
Empire—Mallets. Greene, Tweed & Co., Bronx, N. Y.
Endurance—Cement and Paint. Glidden Company, Cleveland, O.
Enduro—Sheets. Republic Steel Corp., Cleveland, O.
Epco—Perforated Metals. Erdle Perforating Co., Rochester, N. Y.
EPCO — Welding Timer. Electronic Products Co., Geneva, Ill.
Era — Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.
Era Exl-Air—Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.
Esco—Smoke Pipe Dampers. Eselgroth & Co., Newark, N. J.
Esico — Electric Soldering Coppers. Electric Soldering Iron Co., Inc., Deep River, Conn.
Esseo — Solder, Paint, Roofer Tools. Eastern States Supply Co., Brooklyn, N. Y.
Esso—Furnaces, Oil Burners. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Eternium—Paint, Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
Eureka — Furnaces. Home Stove Co., Indianapolis, Ind.
EuteChroms — Electrodes and Welding Rod. Eutectic Welding Alloys Co., New York.
Eutector—Flux. Eutectic Welding Alloys Co., New York City.
EutecRods — Welding Rods. Eutectic Welding Alloys Co., New York City.
EutecTrodes — Electrodes. Eutectic Welding Alloys Co., New York City.
Even-Flo—Floor Furnaces. Air Products, Inc., Pittsburg, Kans.
Evenheet — Damper Motors. Sampsell Time Control, Inc., Spring Valley, Ill.
Everdur — Plates, Sheets, Electrodes, Welding Rod. American Brass Co., Waterbury, Conn.
Everedy—Oil Burners. Mt. Hawley Mfg. Co., Peoria, Ill.
Everjet — Roofing Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
Everwear—Eaves Trough and Gutters with Fittings, Ridge Rolls and Ridging, Roofing, Metal Shingles and Tile. Southern States Iron Roofing Co., Savannah, Ga.
Exidust — Dust Collectors. Allen Billmyre Div., Lamson Corp., Mamaroneck, N. Y.
Ex-L-ite—Sheets. Republic Steel Corporation, Cleveland, Ohio.
E-Z-On—Damper Clips and Tips, and Damper Regulators. M. A. Gerett Co., Milwaukee, Wis.

F

F & E—Underfeed Stokers. Flynn & Emrich Co., Baltimore, Md.
FMD — Solder. Federated Metals Division, American Smelting and Refining Co., New York City.
Fabrikated — Faces, Grilles, Registers. Independent Register Co., Cleveland, O.
Faceweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Fairweather — Blower - Washer Units. Furblo Company, Hermansville, Mich.
Falco—Sheets. Fairmont Aluminum Co., Fairmont, W. Va.
Famous — Furnaces. Excelsior Steel Furnace Co., Chicago.
Famous Exl-Air — Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago, Ill.
Far-Air—Evaporative Coolers, Filters. Farr Co., Los Angeles, Calif.
Farco—Soldering Flux. Farrelloy Company, Inc., Philadelphia, Pa.
Fargail—Soldering Flux. Farrelloy Co., Philadelphia.
Farquar—Furnaces. Farquhar Furnace Co., Wilmington, O.
Farsol—Soldering Flux. Farrelloy Co., Inc., Philadelphia.
Fastemp—Furnaces. Norge Heat Div., Borg-Warner Corp., Detroit, Mich.
Fentherfin—Coils. L. J. Wing Mfg. Co., New York, N. Y.
Fentherweight — Insulation. Keasbey & Mattison Co., Ambler, Pa.
Federal—Refractories. U. S. Stoneware Co., Akron, O.
F Electric — Fan Roof Ventilators. Hirschman-Poble Co., Inc., LeRoy, N. Y.
Felt-Cote — Steel Roofing. American Steel Band Co., Pittsburgh, Pa.
Fenestra — Heat Insulating Windows. Detroit Steel Products Co., Detroit, Mich.
Fenn's Rotary—Roof Ventilators. Waverly Heating Supply Co., Boston, Mass.
Ferro—Soldering Flux. Linde Air Products Co., New York.
Ferrobord—Steel Roofing. Truscon Steel Co., Youngstown, O.
Ferroclad — Building Insulation. Truscon Steel Co., Youngstown, O.
Ferro - Therm — Reflective Insulation. American Flange & Mfg. Co., Inc., New York City.
Ferroweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Fiberglas — Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Fiberkote — Roof Cement. National Manufacturing Corp., Tonawanda, N. Y.

Fi-Blak — Insulation. Western Rock Wool Corp., Huntington, Ind.
Fibronized — Plastic Tubing. Irvington Varnish & Insulator Co., Irvington, N. J.
Filtered Aire — Blower - Filters. American Foundry & Furnace Co., Bloomington, Ill.
Filterpure — Coils. Betz Corporation, Hammond, Ind.
Findlay — Stokers. Central Rubber & Steel Corporation, Findlay, Ohio.
Fin-Flex—Directional Flow Registers. The Auer Register Co., Cleveland, O.
Finn-Tense — Conversion Gas Burner. Jerry Finn Engineers, St. Paul.
Firebox — Combustion Chambers. Sid Harvey, Inc., Valley Stream, N. Y.
Fire Boy—Conversion Burners. Moore Equipment Co., Lincoln, Nebr.
Fibercote — Roofing Paint. Midland Paint & Varnish Co., Cleveland.
Firecrete — Refractories. Johns-Manville, New York, N. Y.
Firedaire — Circulating Heaters. Edwards Mfg. Co., Inc., Cincinnati, O.
Fire-Guard — Stokers. Peerless Mfg. Corp., Louisville, Ky.
Fire-Hearth — Castable Refractories. Fireline Stove & Furnace Lining Co., Chicago, Ill.
Firelte — Cement. Johns-Manville, New York, N. Y.
Fire-King — Stokers. Sinker-Davis Co., Indianapolis, Ind.
Fireline—Furnace Firepot Lining. Fireline Stove & Furnace Lining Co., Chicago.
Firelite—Refractories. Fireline Stove & Furnace Lining Co., Chicago.
Fire Pilot — Stoker Control. Sampsel Time Control, Inc., Spring Valley, Ill.
Fire Tender—Stokers. Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
Firma — Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Fitrite—Conductor, Eaves Trough and Gutter Fittings and Accessories, Skylight Lifts, Snow Guards, Ventilators. David Levow, or Rival Strap Corp., New York, N. Y.
Fixit — Cement. National Mfg. Corp., Tonawanda, N. Y.
Flame-Otrol — Controls. Wheelco Instruments Company, Chicago.
Flash-Off No. 99 — Industrial Finish. Acme White Lead & Color Works, Detroit, Mich.
Flash-Rite—Flashing. Figge Co., Chicago.
Flatjet—Spray Nozzles. Spraying Systems Co., Chicago, Ill.
Flat-Top—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
Fleetweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Fleur de Lis—Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.
Flexaire—Registers and Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
Flexare—Arc Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Flexaust—Hose. American Ventilating Hose Co., New York City.
Flexibiac — Paint. Samuel Cabot, Inc., Boston, Mass.
Flexi-Flow—Pressure Blowers. Moore Co., Kansas City, Mo.
Flex-Tube—Draft Gauges. F. W. Dwyer Mfg. Co., Chicago, Ill.
Flo-Co — Furnaces. Floral City Co., Monroe, Mich.
Flo-Warm—Coal, Oil, Gas and Stoker-Fired Furnaces. Williamson Heater Co., Cincinnati, O.
Flualyzer—Portable CO_2 Analyzer. Chas. Englehard, Inc., East Newark, N. J.
Foamglas—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, and Pittsburgh Corning Corporation, Pittsburgh.
Follansbee—Furnace Pipe. Sheet Metal Specialty Co., Pittsburgh, Pa.
Forbes Syphonaire — Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Ford's Black Metal—Metal Protecting Paint. Ford Roofing Products Co., Chicago.
Ford - V - Neer — Building Insulation. Ford Roofing Products Co., Chicago, Ill.
Forstair—Circulating Heaters. Pernot & Rich, Inc., Los Angeles, Calif.
Fosco—Skylights. F. O. Schoedinger, Columbus, O.
Fosco Standard—Water Heaters. F. O. Schoedinger, Columbus, Ohio.
Fosco Thermoray—Gas Space Heaters. F. O. Schoedinger, Columbus, Ohio.
Foundation Coating — Waterproofing. Glidden Co., Cleveland, O.
4-Way-Flow—Registers. U. S. Register Co., Battle Creek, Mich.
Fractional Horsepower—V-Belts. B. F. Goodrich Co., Akron, O.
Fracto - Crete — Castable Refractory. Ramtite Co., Chicago.
Franzite—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Free-Aire—Air Conditioning Units, Furnaces, Heaters. Kehm Corporation, Chicago.
Freeman—Stokers. Illinois Iron & Bolt Co., Chicago, Ill.
Fresh-Air Maker — Fans, Ventilators. Schwitzer-Cummins Co., Indianapolis.
Frigid—Night Air Cooling and Exhaust Fans, Fan Blades, Housings. Circulators & Devices Mfg. Corp., New York, N. Y.
Fros-T-nire — Air Conditioning Units. Palmer Manufacturing Corp., Phoenix, Ariz.
Frost-O-Lite—Paint. Sanvin Chemical Products Co., Moline, Ill.
Fuel - Door — Gas Burners. Handley Brown Heater Co., Jackson, Mich.
Fuel-Saver—Automatic Draft Regulator. Walker Mfg. & Sales Corp., St. Joseph, Mo.
Fueltone — Oil Tank Solvent. Ampion Corporation, Long Island City.
Fulflo — Fuel Oil Filter. Commercial Filters Corp., Boston.
Fulljet — Spray Nozzles. Spraying Systems Co., Chicago, Ill.
Fulscope—Controls. Taylor Instrument Companies, Rochester, N. Y.
Fulton—Register Shield. Patent Novelty Co., Fulton, Ill.
Fyre-Mortar—Insulating Cement. Quigley Company, Inc., New York, N. Y.
Fyr-Feeder — Stokers. American Coal Burner Company, Chicago, Ill.
Fyrite—CO_2 Analyzers. Bacharach Industrial Instrument Co., Pittsburgh.
Fyr-Fly—Oil Burners. The Aldrich Co., Wyoming, Ill.

G

GB—Furnaces. General Bronze Corporation, Long Island City, N. Y.
G. B. C. — Blowers and Fans. General Blower Co., Philadelphia, Pa.
G/C — Controls. General Controls Co., Glendale, Calif.
G-E—Air Conditioning Units, Oil Burners, Compressors, Controls, Soldering Coppers, Couplings, Electrodes, Fans, Flux, Furnaces, Humidistats, Motors, Relays, Switches, Transformers, Solenoid Valves, Thermostats, Welders. General Electric Co., Bloomfield, N. J., and Schenectady, N. Y.
G - E - Germicidal — Sterilizing Lamps. General Electric Co., Cleveland.
G-E Textolite—Tubing. General Electric Co., Chemical Dept., Pittsfield, Mass.
G-M—Louvres, Shutters, Metal Stampings, Ventilators. Gillian Mfg. Co., Detroit, Mich.
G. R. — Air Conditioning Units. Window Ventilators and Filter Units. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
G-R — Welders. Glenn-Roberts Company, Oakland, Calif.
G-W — Furnaces. Gar Wood Industries, Inc., Wayne, Mich.
Galbestos—Roofing. H. H. Robertson Co., Pittsburgh.
Galvanide—Metal Protecting Paint. A. C. Horn Co., Inc., Long Island City, N. Y.
Gal-Va-Nite — Aluminum Paint. Ford Roofing Products Co., Chicago.
Galvaprep—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.
Galv - O - Zinc — Coating, Paint. Blue Ridge Talc Co., Inc., Henry, Va.
Gas-a-Fire — Gas Conversion Burners. Automatic Firing Corporation, St. Louis.
Gas King—Furnaces. J. King Kent & Co., St. Louis, Mo.
Gas Mizer—Furnaces. Floral City Co., Monroe, Mich.
Gastite — Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.
Gas-Vac—Furnaces, Heaters. Vacuum Gas Appliances, Rome, N. Y.
Gasweld—Soldering Coppers, Torches, and Welding Equipment. Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Gem—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.
Gem—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.
Gemnco—Compressors, General Machinery Co., Spokane, Wash.
Gemco—Air Conditioners. General Engineering & Mfg. Co., St. Louis.
Gemmatic—Gas Conversion Burner. Gas Equipment Manufacturing Co., Cleveland.
Gemware — Hygrometers. Psychrometers, Thermometers. G. M. Mfg. Co., New York, N. Y.
General — Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
Generator—Coils. Hotstream Heater Co., Cleveland, O.
Genoco—Oil Burners. General Oil Heating Corp., West New York, N. J.
Germicidal — Sterilizing Lamp. General Electric Co., Cleveland.
Gerotor — Fuel Oil Pump. May Oil Burner Div., Gerotor May Corp., Baltimore.
Giant — Oil Burners. Aldrich Co., Wyoming, Ill.
Giant — Skylight Lifts. Danzer Metal Works Co., Hagerstown, Md.
Giant Red Devil—Pullers. Crescent Tool Co., Jamestown, N. Y.
Gibraltar—Furnace and Heaters. P. H. MaGirl Foundry & Furnace Works, Bloomington, Ill.
Gilbarco—Furnaces, Oil Burners. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilco—Water Heaters. J. L. Gillen Co., Dowagiac, Mich.
Gilt Edge — Furnaces. Schwab Furnace Co., Milwaukee, Wis.
Gipsy—Circulating Gas Heaters. Independence Stove & Furnace Co., Independence, Mo.
Gladiator—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.
Globe—Sheets. Newport Rolling Mill Co., Newport, Ky.
Globe Sizzler—Hot Water Coils. Globe Machinery & Supply Co., Des Moines, Ia.
Glo-Cone — Gas Burners. Geisel Mfg., Inc., Elyria, O.
Glo-Fyr—Oil Burners. Aldrich Co., Wyoming, Ill.
Glo-Heat—Gas Burners. American Htg. & Eng. Co., New Albany, Ind.
GLOWAN—Gas Burners. J. O. & C. U. Martin, San Francisco, Calif.
Gnome—Oil Burners. Aldrich Co., Wyoming, Ill.
Gohi — Eaves Trough & Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
Gohi—Sheets. Newport Rolling Mill Co., Newport, Ky.
Gold Bond—Insulation Board, Tile. National Gypsum Co., Buffalo, N. Y.
Gold Bond-Gimco — Rock Wool Products, Insulating Cement. National Gypsum Co., Buffalo, N. Y.
Gordon—Gas Conversion Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Grad-U-Flow—Registers. Minneapolis-Honeywell Regulator Co., Minneapolis.

Gradutrol — Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Grand Rapids — Vacuum Furnace Cleaner. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.

Graylite—Building and Duct Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.

Greastop — Filters. Air-Maze Corporation, Cleveland, O.

Grid—Heating and Cooling Coils. D. J. Murray Mfg. Co., Wausau, Wis.

Grillometer—Direct Reading Air Velocity Meter. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.

Gross - Aire — Furnaces and Stokers. Grossenbacher Furnace Co., St. Louis, Mo.

H

H-B—Gas Conversion Burner. Handley Brown Heater Co., Jackson, Mich.

H&C—Registers. Hart & Cooley Mfg. Co., Holland, Mich.

H & K—Perforated Metals. Harrington & King Perforating Co., Chicago, Ill.

H & M—Gas Burners. Hook & Miller, Pittsburg.

H-M—Gas Pressure Regulating Valves. Thermac Co., Los Angeles.

Haco—Furnaces. J. W. Hopwood and Associates, Inc., Cleveland.

Hair Glass—Filters. H. J. Somers, Inc., Detroit, Mich.

Hammerkraft—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Hammer-Sets—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.

Handnib — Punches. National Machine Tool Co., Racine, Wis.

Handy—Pipe, Prefabricated Ducts and Fittings. F. Meyer & Bro. Co., Peoria, Ill.

Handy-Flux—Soldering Flux. Handy & Harman, New York, N. Y.

Happy Thought — Heaters. Pittston Stove Co., Pittston, Pa.

Hardlead—Lead Roofing. National Lead Co., New York.

Hardweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Hart—Oil Burners. Avery Farm Machinery Co., Peoria, Ill.

Hartford-Lincoln—Shear. Lincoln Machine Co., Boston.

Hart-Heat—Furnaces. Avery Farm Machinery Co., Peoria, Ill.

Health-aire—Blower, Coils, Fans, Louvers and Shutters and Ventilators. Johnson Fan & Blower Corp., Chicago, Ill.

Hearth—Refractories. Refractory & Insulation Corporation, New York, N. Y.

Hearth-Glo — Space Heaters. Jackes-Evans Mfg. Co., St. Louis.

Heat-Aid — Furnace Linings. Pyrolite Products Co., Cleveland, Ohio.

Hentane — Liquid Petroleum Water Heaters. Hoyt Heater Co., Los Angeles.

Heat Breaker—Fans. Warren Earl Company, Houston, Tex.

Heat Holder—Baffles. Sid Harvey, Inc., Valley Stream, N. Y.

Heatmaster — Oil Burners. Cooper & Cooper, Inc., Pittsfield, Mass.

Heatmaster—Floor Furnaces. Universal Metal Products, Los Angeles.

Heat-O-Meter—Controls. Miller Heat-O-Meter Co., Milwaukee.

Heat-Pak—Oil Burners. Aldrich Co., Wyoming, Ill.

Heat-Rite — Gravity Registers. Auer Register Co., Cleveland, O.

Heatrola—Heaters. Estate Stove Co., Hamilton, O.

Heatseal—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

Heatwave — Floor Furnaces. Spartan Aircraft Co., Tulsa, Okla.

Heatway — Stoker Furnace. Rheem Manufacturing Co., New York City.

Heavyduty—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.

Heet-Master — Kettles. Aeroil Burner Co., Inc., West New York, N. J.

Hellite — Refractories. Johns-Manville, New York.

Helyx—Drive Screws, Nails. Hillwood Manufacturing Co., Cleveland, O.

Herco — Welders, Transformers. Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.

Heresite—Pipe and Fittings. Heremetal Co., Minneapolis, Minn.

Hermetic—Furnaces. Favorite Mfg. Co., Piqua, Ohio.

Hero—Heaters. J. V. Patten Co., Sycamore, Ill.

Hevikoat—Electrodes Universal Welder Corporation, Cleevland, Ohio.

Hi-Boy — Furnaces. Aladdin Heating Corp., Oakland, Calif.

HiBoy—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Hicycle—Electric Tools. Chicago Pneumatic Tool Co., New York, N. Y.

Highway — Copper Iron. Apollo Steel Co., Apollo, Pa.

Hi Heat—Gas Burners. Hansen Electric Co., San Francisco.

Hi-Heat Gray — Paint. Wailes Dove-Hermiston Corporation, Westfield, N. J.

Hilo Spatter — Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Hilume—Aluminum Paint. Hilo Varnish Corp., Brooklyn, N. Y.

Hi-Speed—Electric Dimpler. York Electric Tool Co., York, Pa.

Hi-Speed—Nibbler and Shears. Libert Machine Co., Green Bay, Wis.

Hi-Speed—Welding and Cutting Apparatus. Dockson Corporation, Detroit.

Hi-Spra—Spray Nozzles. Thermal Industries, Indio, Calif.

Hi-Steel—Alloy Steel. Inland Steel Co., Chicago.

High - Ten - No. 500 — Flux. Industrial Service Laboratories, Milwaukee, Wis.

Hi-Test—Water Heaters. Hoyt Heater Co., Los Angeles.

Hoffman — Water Heaters. Clayton & Lambert Mfg. Co., Louisville.

Hold Heat—Soldering Coppers. Turner Brass Works, Sycamore, Ill.

Holgun—Portable Electric Drills, Black & Decker Mfg. Co., Towson, Md.

Holly Glen—Water Heaters. Hollywood Water Heater Co., Glendale, Calif.

Holtite—Screws. Continental Screw Co., New Bedford, Mass.

Home — Furnaces. Des Moines Stove Repair Co., Des Moines, Iowa.

Home Comfort—Blowers, Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Horneblende — Metal Protecting Paint, Compounds. North American Fibre Products Co., Cleveland, Ohio.

Hot Blast—Furnaces and Heaters. Cole Hot Blast Mfg. Co., Chicago, Ill.

Hot Blast — Soldering Furnaces and Torches. Turner Brass Works, Sycamore, Ill.

Hotco—Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.

Hot Spot—Electric Welders. Acme Electric Welder Co., Los Angeles, Calif.

Howie — Heat Savers. Condensation Engineering Corp., Chicago, Ill.

Huber—Overfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

Humiclean—Cleaning Compound. Carolina Aniline & Extract Co., Charlotte, N. C.

Humidair — Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.

Humidair—Washers. American Foundry & Furnace Co., Bloomington, Ill.

Humid-Aire—Humidifiers. Meyer Furnace Co., Peoria, Ill.

Humidigraph — Hygrometers. Bristol Company, Waterbury, Conn.

Humidiguide—Hygrometer. Taylor Instrument Companies, Rochester, N. Y.

Humidostat — Humidistats. Johnson Service Co., Milwaukee, Wis.

Humphrey — Furnaces and Heaters. General Gas Light Co., Kalamazoo, Mich.

Hy-Boy—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Hycarb—Electrodes. Universal Welder Corporation, Cleveland, O.

Hydramotor — Gas Regulating Valve. General Controls Co., Glendale, Calif.

Hydraulic - Action — Controls. White-Rodgers Electric Co., St. Louis, Mo.

Hydrocide—Waterproofing. L. Sonneborn Sons., Inc., New York, N. Y.

Hydro-Whirl—Dust Collectors. Peters-Dalton, Inc., Detroit, Mich.

Hy-Duty—Blowers, Wheels. Schwitzer-Cummins Co., Indianapolis, Ind.

Hy-Power—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Hyspar — Roof Cement, Compounds, Paint, Midland Paint & Varnish Co., Cleveland, O.

Hy-Speed — Hydraulic Tools. Munton Manufacturing Co., Franklin Park, Ill.

Hytemp—Insulation. Keasbey & Mattison Company, Ambler, Pa.

Hytempite—Furnace Cement. Quigley Company, Inc., New York, N. Y.

I

IEC—Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

Ideal—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.

Ideal — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Ideal — Roofing Nails. Tennessee Coal Iron & Railroad Co., Birmingham, Ala.

Ideal (Air Cell)—Insulation. Hinde & Dauch Paper Co., Sandusky, Ohio.

Ilgair — Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Ilgette—Kitchen Exhaust Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Illbronze—Aluminum Paste and Powder. Illinois Bronze Powder Co., Inc., Chicago.

Immersantherm — Domestic Hot Water Supply Control. Mercoid Corp., Chicago.

Impact—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York, N. Y.

Imperial—Pillow Blocks. Anti-Friction Bearings Co., Los Angeles.

Inco — Paint. Inter-Coastal Paint Co., East St. Louis, Ill.

Inconel — Alloy Plates, Sheet, Tubing. International Nickel Company, Inc., New York, N. Y.

Independent — Heaters. Independence Stove & Furnace Co., Independence, Mo.

Indian—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

IngAclad—Plates and Sheets. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill.

Ingels — Elbow Machine. Maplewood Machinery Co., Chicago.

Ingot Iron—Sheets, Ridge Rolls and Ridging. American Rolling Mill Co., Middletown, Ohio.

Inkstop—Filters. Air-Maze Corporation, Cleveland, Ohio.

Insa-Lute—Insulating Cement. Sauereisen Cements Co., Pittsburgh, Pa.

Ins-Lite—Building and Duct Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.

Insulag—Insulation and Insulating Cement. Quigley Co., Inc., New York, N. Y.

Insulate - Windows — Heat Insulating Windows. Chamberlin Company of America, Detroit.

Insulbrick — Insulation. Quigley Co., Inc., New York, N. Y.

Insulcrete — Insulation. Quigley Co., Inc., New York, N. Y.

Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.

Insulmat—Insulation. J. W. Mortell Co., Kankakee. Ill.

Interlock—Pipe. Milcor Steel Co., Milwaukee, Wis.

Interlox—Plastic Tee. Extruded Plastics, Inc., Norwalk, Conn.

Inter-Matic—Time Switches. International Register Co., Chicago.

Ironhide—Paint. Pittsburgh Plate Glass Co., Pittsburgh.

Iron Lung — Ventilators. Powermatic Ventilator Company, Cleveland.

Ironset — Asbestos Furnace Cement. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Irpo—Rust-Proofing. Wolfe-Kote Co., Sheboygan, Wis.

Isl City—Registers. Rock Island Register Co., Rock Island, Ill.
Ivanhoe—Heaters. Perfection Stove Co., Inc., Cleveland, O.

J

J & C—Blowers, Oil Burners, Furnaces. Jackson & Church Co., Saginaw, Mich.
JFS—Transmissions. Stephen-Adamson Mfg. Co., Aurora, Ill.
J-M — Insulation, Roofing. Johns-Manville, New York, N. Y.
Janitrol — A. C. Units, Gas Burners, Furnaces. Surface Combustion, Toledo, O.
Ject-O-Valve — Ventilators. Swartwout Co., Cleveland.
Jiffee — Coils. Hotstream Heater Co., Cleveland, O.
Jiffy — Regulator Set. Parker-Kalon Corp., New York, N. Y.
Jointite—Insulation. Mundet Cork Corporation, Brooklyn.
Jumbo—Oil Burners. The Aldrich Co., Wyoming, Ill.
June-Aire—Furnaces. American Foundry & Furn. Co., Bloomington, Ill.
Juniatn—Soldering Flux. Geo. W. Diener Mfg. Co., Chicago, Ill.
Junior—Fans. West Wind Corporation, Seattle.
Junior—Water Heaters. SuperbO Mfg. Co., Los Angeles.
JusRite—Ducts and Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.
JusRite L-Bo—Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.

K

K-B—Damper Clips, Tips and Regulator Sets. G. L. Kerentoff, Cincinnati, Ohio.
KCB—Sheets. Newport Rolling Mill Co., Newport, Ky.
KCB—Eaves Trough and Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
K&M—Insulation. Keasbey & Mattison Co., Ambler, Pa.
K&M Duplex — Insulation. Keasbey & Mattison Co., Ambler, Pa.
K&M Hy-Temp—Insulation, Keasbey & Mattison Co., Ambler, Pa.
K&M Simplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
KO — Hoists. Stephens - Adamson Mfg. Co., Aurora, Ill.
K.S.V.—Ventilators. Kernchen Co., Chicago, Ill.
Kant Krush — Roof Strainers. Grand Rapids Wire Products Co., Grand Rapids, Mich.
Kast-O-Lite—Refractories. A. P. Green Fire Brick Co., Mexico, Mo.
Kastite—Castable Refractory. Chicago Fire Brick Co., Chicago.
Kathabar—A. C. Units. Dehumidifiers. Surface Combustion, Toledo, O.
Kaukit—Caulking Compound. L. Sonneborn Sons Inc., New York, N. Y.
Keldur — Vibration Isolators. Hobsite Products Co., New York City.
Kelsey - Bradley — Furnaces. Kelsey Heating Co., Inc., Syracuse, N. Y.
Kenwood — Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Keystone—Heaters. J. V. Patten Co., Sycamore, Ill.
Keystone — Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Kimsul — Insulation. Kimberly - Clark Corp., Neenah, Wis.
Kitchen - Aire — Kitchen Ventilators. Stewart Manufacturing Co., Indianapolis, Ind.
Kitch - N - Ventor — Fans. Universal Blower Company, Birmingham, Mich.
Kleenflo — Filters. Air-Maze Corp., Cleveland, O.
Klixon—Controls, Thermostats. Spencer Thermostat Co., Attleboro, Mass.
Klondike—Welders. Ralph Fern, Scranton, Pa.
Klosd—Motors. Sterling Electric Motors, Inc., Los Angeles.
Knock - Out — Arc Welders, Buffers, Grinders, Polishers and Sanders. K. O. Lee & Son Co., Aberdeen, S. D.
Kno-Draft — High Velocity Air Diffusers. W. B. Connor Eng. Corp., Dorex Div., New York, N. Y.
Kold-Aire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.
Kolstoker — Stokers. Anchor Stove & Range Co., New Albany, Ind.
Kompak—Filters. Drico Industrial Corporation, New York City.
Kooler-Aire — Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.
Koolshade—Sun Reflecting Screens. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Koppax—Paint. Koppers Co., Inc., Pittsburgh, Pa.
KopperKore — Electric Soldering Iron. Sound Equipment Corporation, Glendale, Calif.
Korolax RX — Metal Protective Coatings. B. F. Goodrich Co., Akron, O.
Koroseal—Plastic. B. F. Goodrich Co., Akron, O.
Koroseal Tape RX — Protective Coatings. B. F. Goodrich Co., Akron, O.
Krack—Coils. Refrigeration Appliances, Inc., Chicago.
Kres-Kno Perco-Flash—Water Heaters. Kresno-Stamm Co., New York City.
Kristokrak — Enamels and Lacquers. Zapon Division Atlas Powder Co., North Chicago, Ill.
Krome - Kote — Welding Compound. Wolfe-Kote Co., Sheboygan, Wis.
Kwik-Melter—Roofers' Kettles. Littleford Bros., Inc., Cincinnati.
Kwik-Way — Ladder Brackets. Myers Ladder Equipment Co., Madison, Wis.

L

L. A.—Motors. Louis Allis Co., Milwaukee, Wis.
L-M — Tubing. Lewin - Mathes Co., St. Louis, Mo.
L & N—Instruments. Leeds & Northrup Co., Philadelphia, Pa.
L & R—Conductor Pipe. Lamb & Ritchie Co., Cambridge, Mass.
L-U—Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
La-Cal — Water Heaters. Hollywood Water Heater Co., Glendale, Calif.
Lacq — Lacquers. Glidden Company, Cleveland, O.
Lancol—Stainless Steel Soldering Flux. F. H. Langsenkamp Co., Indianapolis, Ind.
Larco—Mineral Paste. Western Mineral Products Co., Omaha, Nebr.
Lassen—Water Heaters. Dalco Appliance Co., San Francisco.
Latest—Skylight Lifts. Danzer Metal Works Co., Hagerstown, Md.
Lawson—Heaters. United States Stove Co., South Pittsburg, Tenn.
Leader — Furnaces. Berger Furnace Co., Pittsburgh.
Leader — Oil Burners and Circulating Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.
Lead-Head—Nails. W. H. Maze Co., Peru, Ill.
Lead-Seal—Roofing Nails. The Deniston Co., Chicago, Ill.
Lead-Sealed—Sheets. Continental Steel Corp., Kokomo, Ind.
Leastoker—Stokers. H. Leslie Leas Co., Monona, Ia.
Leadtex—Lead-Coated Sheets. Revere Copper and Brass Incorporated, New York, N. Y.
Lectrodryer — Dehumidifier. Pittsburgh Lectrodryer Corp., Pittsburgh.
Lectro-Glo—Heaters. Day & Night Mfg. Co., Monrovia, Calif.
Lehigh — Furnaces, Heaters. Pittston Stove Co., Pittston, Pa.
Leonard—Circulating Oil Heater. W. R. Ames Co., San Francisco, Calif.
LeRoy—Fan and Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Levelometer—Liquid Level Gauge. Liquidometer Corp., Long Island City.
Liberty—Water Heaters. Day & Night Mfg. Co., Monrovia, Calif.
Liberty — Furnaces, Dowagiac Steel Furnace Co., Dowagiac, Mich.
Liberty—Roof Cement. Carter Paint Co., Liberty, Ind.
Liberty—Ventilators. Penn Ventilating Company, Philadelphia, Pa.
Life-Line—Motors. Westinghouse Electric Corporation, East Pittsburgh.
Lifetime — Roofing, Sheets, Shingles. Reynolds Metals Company, Louisville, Ky.
Lifetime — Furnaces. Hart & Crouse Corp., Utica, N. Y.
Lightening—Hole Punches. C-B Tool Co., Lancaster, Pa.
Lightweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Lincolnweld — Arc Welders, The Lincoln Electric Co., Cleveland, O.
Linestart—Motors. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Lipman — Coils, Compressors. General Refrigeration Div., Yates - American Machine Co., Beloit, Wis.
Liquid Gas — Water Heaters. Rheem Mfg. Co., New York City.
Lite - Cast — Combustion Chambers. Monogram Combustion Chamber Co., Philadelphia 4.
Lithoform — Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.
Little Blacksmith — Punches and Slitting Machines. J. F. Kidder Mfg. Co., Inc., Burlington, Vt.
Little Bobby — Bending Brakes. A. R. Harris, Hammond, Ind.
Little Giant — Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Lloyd's—Stainless Soldering Flux. Lloyd S. Johnson Co., Chicago, Ill.
Lloyd's No. 7 — Silver Solder Flux. Lloyd S. Johnson Co., Chicago, Ill.
Lo-Bill—Storage Water Heater. Autogas Co., Chicago.
Lo - Blast — Gas Conversion Burners. Mid-Continental Metal Products Co., Chicago.
Lo-Boy—Stokers. Whiting Corp., Harvey, Ill.
Lo-Boy—Water Heaters. Allen Manufacturing Co., Inc., Nashville, Tenn.
Locarb—Electrodes. Universal Welder Corporation, Cleveland, O.
Locknire—Insulation Board. Plastergon Wall Board Co., Buffalo, N. Y.
Lock-Joint—Pipe and Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.
Locktite — Damper Regulators. Ohio Products Co., Cleveland, O.
Lok-Joint — Insulating Lath. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.
LoMaintenance—N. Electric Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Longwood—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Lornate—Chimney Caps & Tops, Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Lowdensite — Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.
Lown—Slip Roll Forming Machines. San Angelo Foundry & Machinery Co., San Angelo, Texas.
Luco—Acid Brushes, Flux, Solder. Thos. F. Lukens Metal Co., Philadelphia.
Lume-Tex—Aluminum Paint. Truscon Laboratories, Detroit.
Luminare — Electrodes. Universal Welder Corporation, Cleveland, O.
Lumino—Paint. Koppers Co., Inc., Pittsburgh, Pa.
Luminous Vortex — Oil Burners. Iron Fireman Mfg. Co., Cleveland.
Lumitall — Aluminum Paint. National Mfg. Co., Tonawanda, N. Y.
Lupton—Skylights. Michael Flynn Mfg. Co., Philadelphia.
Lustralumin — Aluminum Paint. Blue Ridge Talc Co., Inc., Henry, Va.

Luxaire—Blower-Filters, Furnaces and Humidifiers, Pipe. The C. A. Olsen Manufacturing Co., Elyria, O.

Lyonore—Sheets. Lyon-Conklin & Co., Inc., Baltimore, Md.

Lyston—Soldering Flux. Farrelloy Co., Inc., Philadelphia.

Lytestone — Soldering Flux, Tinning Baths. Farrelloy Company, Inc., Philadelphia, Pa.

M

M. E.—Motors. Marathon Electric Mfg. Corp., Wassau, Wis.

M.F.C.—Gas Floor Furnaces. Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.

M-H—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

M & H — Zinc Sheets. Matthiessen & Hegeler Zinc Co., LaSalle, Ill.

M & M—Humidifiers and Fittings, Nozzles, Switches and Valves. McDonnell & Miller, Chicago, Ill.

M-R—Wire Glass. H. H. Robertson Co., Pittsburgh.

M-VB—Fittings, Valves. Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.

M/W—Filters. American Air Filter Co., Inc., Louisville, Ky.

Macheta—Fans and Fan Blades, Ventilators. Aerovent Fan Co., Piqua, O.

Mack—Heaters. J. V. Patten Co., Sycamore, Ill.

Magic Dial—Thermostats. Perfex Corporation, Milwaukee, Wis.

Magnalite—Glass. J. Merrill Richards, Boston.

Majestic—Roofing, Skylights, Ventilators. W. A. Fingles, Inc., Baltimore, Md.

Maildrill—Electric Drills. Mall Tool Co., Chicago.

Mammoth—Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.

Manganarc — Electrodes. Universal Welder Corporation, Cleveland.

Manganend—Electrodes. Arcos Corporation, Philadelphia, Pa.

Manganesed-Phospholene No. 7 — Rust Preventive. Western Reserve Laboratories, Cleveland.

Manganweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Marietta — Enamels and Lacquers. American-Marietta Co., Chicago, Ill.

Mark Time—Relays, Time Switches. M. H. Rhodes, Inc., Hartford, Conn.

Marlox—Metal Protecting Paints. Marley Chemical Co., Detroit, Mich.

Mars—Furnaces. Pacific Gas Heating Co., San Francisco, Calif.

Mars Hi-Boy — Furnaces. Pacific Gas Heating Co., San Francisco.

Marsails—Air Conditioners, Dust Collectors, Attic Fans, Pumps, Ventilators. American Metal Products Co., Fort Worth, Texas.

Marvel — Punches. Armstrong - Blum Mfg. Co., Chicago, Ill.

Marvelous — Storage Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Masco — Combustion Chambers. Munn and Steele, Inc., Newark, N. J.

Mascobond—Furnace Cement and Insulation. Munn and Steele, Inc., Newark, N. J.

Mascokast — Refractory. Munn and Steele, Inc., Newark, N. J.

Mascote—Insulating Cement and Duct Insulation. Munn and Steele, Inc., Newark, N. J.

Masecrete — Refractories. Munn and Steele, Inc., Newark, N. J.

Massachusetts—Blowers, Fans. Bishop & Babcock Mfg. Co., Cleveland, O.

Master — Controls, Motors, Pulleys, Thermostats. White Mfg. Co., St. Paul, Minn.

Master — Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Master—Circles, Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Master—Stokers. Muncie Gear Works, Inc., Muncie, Ind.

Master Blowertrol — Thermostatic Hydraulic Control. White Mfg. Co., Minneapolis, Minn.

Master Kraft—Coils, Oil Burners and Heat Savers. Harvey-Whipple, Inc., Springfield, Mass.

Master Line—Soldering Torches. Turner Brass Works, Sycamore, Ill.

Mastic Board—Insulation. Keystone Asphalt Products Co., Chicago.

Mayari R — Nickel - Chromium Sheets and Plates. Bethlehem Steel Co., Bethlehem, Pa.

Mayn Air—Stack Head Dampers. Henry Furnace Co., Medina, Ohio.

McDonaldaire—Furnaces. A. Y. McDonald Mfg. Co., Dubuque, Ia.

McKee — Gas Burners. Eclipse Fuel Engineering Co., Rockford, Ill.

Mecco—Doors and Shutters, Skylights, Ventilators. Moeschel - Edwards Co., Inc., Cincinnati, O.

Meco—Gas Welding Rod, Torches. Modern Engineering Co., St. Louis, Mo.

Meco Jiffy—Soldering Torches. Modern Engineering Co., St. Louis, Mo.

Melo-Air — Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Mel-Rock — Fan-Filters, Ventilators and Washers. Mellish & Murray Co., Chicago, Ill.

Memphis Super-Fan—Ventilating Fans. Ford Blow Pipe & Manufacturing Co., Memphis, Tenn.

Merlon — Water Heaters. John Wood Mfg. Co., Inc., Conshohocken, Pa.

Mercury—Soldering Irons. Vulcan Electric Co., Danvers, Mass.

Metalbestos—Pipe and Fittings. Williams - Wallace Co., San Francisco, Calif.

Metal-Glo—Metal Cleaners. Turco Products, Inc., Los Angeles.

Metalized Primer Spray—Midland Paint & Varnish Co., Cleveland, O.

Metallite — Paint. Glidden Company, Cleveland, O.

Metal-Master — Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

Metalmaster — Band Saws. DoAll Co., Minneapolis and Des Plaines, Ill.

Metalprep — Rust Preventative Chemicals. Neilson Chemical Co., Detroit, Mich.

Metal Zipper—Arc Welders. Mid-States Equipment Co., Chicago.

Metaphram — Draft Regulator. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Meteor—Hoists. Chisholm-Moore Hoist Corp., Tonawanda, N. Y.

Meteor—Water Heaters. Hoyt Heater Co., Los Angeles.

Metrotherm — Thermostats. General Controls Co., Glendale, Calif.

Micafil — Insulation. Munn and Steel Inc., Newark, N. J.

Micromax — Hygrometers and Recorders. Leeds & Northrup Co., Philadelphia, Pa.

MicroRold—Stainless Sheets. Washington Steel Corporation, Washington, Pa.

Microtrol—Damper Motors. Barber-Colman Co., Rockford, Ill.

Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.

Micro - Turret — Punches. Wiedemann Machine Co., Philadelphia, Pa.

Micro-Weld—Spot Welders. Micro Products Co., Chicago, Ill.

Midget—Bending Brake. A. R. Harris, Hammond, Ind.

Midget — Spot Welders. Universal Welder Corporation, Cleveland.

Midget — Valves. Maid-O'-Mist, Inc., Chicago, Ill.

Mighty Midget — Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

Mighty Midget—Furnaces. Floral City Company, Monroe, Mich.

Mighty Midget Unishear—Shears. Stanley Works, New Britain, Conn.

Milwaukee—Presses and Dies. Doelger & Kirsten, Inc., Milwaukee.

Milwaukee—Water Heaters. A. O. Smith Corporation, Milwaukee.

Mineral Wool Board—Insulation. Armstrong Cork Company, Lancaster, Pa.

Mini-Miser — Storage Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Minnemeyer — Conductor Hooks. La Crosse Steel Roofing & Corrugating Co., LaCrosse, Wis.

Minute—Damper Regulator Sets. Marcliff, Inc., Toledo, O.

Mirro-Matic—Water Heaters. Handley Brown Heater Co., Jackson, Mich.

Mirro-Shell—Water Heaters. Handley Brown Heater Co., Jackson, Mich.

Missouri Flint—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Mixend—Electrodes. Arcos Corp., Philadelphia, Pa.

Model—Furnaces, Heaters. Home Stove Co., Indianapolis, Ind.

Modernair—Blower-Filter Units. Payne Furnace Co., Beverly Hills, Calif.

ModernAire — Furnaces, Humidifiers. Des Moines Stove Repair Co., Des Moines, Ia.

Modernaire — Air Conditioning Units, Fans. Dallas Eng. Co., Inc., Dallas, Tex.

Modern Console—Heaters. Payne Furnace Co., Inc., Beverly Hills, Calif.

Moderne - Aire — Furnaces, Blowers. Agricola Furnace Co., Gadsden, Ala.

Moderne—Blowers, Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Modernistic—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala .

Moduflow—Sectional Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.

Modutrol — Damper Duct Motors and Fan Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Mogul — Rust Preventive Chemicals. North American Fibre Products Co., Cleveland, O.

Mogul Seal—Compounds. North American Fibre Products Co., Cleveland.

Mohawk—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.

Moldit—Refractories. Refractory & Insulation Corp., New York, N. Y.

Moler—Insulation. F. L. Smidth & Co., New York, N. Y.

Monad-Flow — Gas Burners. Monad Products Co., Detroit.

Monarch—Furnaces. Forest City Foundries Co., Cleveland, O.

Moncrief — Furnaces. Henry Furnace Company, Medina, O.

Monel—Sheets, Plate and Tubing. International Nickel Co., Inc., New York, N. Y.

Monend—Arc Welding Electrodes. Arcos Corporation, Philadelphia.

Monitor—Furnaces. Marshall Furnace Co., Marshall, Mich.

Monmouth—Humidifiers. Cleveland Humidifier Co., Cleveland.

Monogram — Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

Mono-Line—Duct Insulation. Quigley Company, Inc., New York, N. Y.

Monovent — Ridge Ventilators. Burt Mfg. Co., Akron, O.

Monroe—Gas Heaters. Dearborn-Monroe Co., Chicago.

Morflex — Flexible Couplings Morse Chain Co., Ithaca, N. Y.

Morse—Blow Pipe Collectors. Goergen-Mackwirth Co., Inc., Buffalo.

Mor-Sun — Furnaces. Morrison Steel Products, Inc., Buffalo, N. Y.

Mortex—Metal Protective Coatings. J. W. Mortell Co., Kankakee, Ill.

Mortite — Caulking and Glazing Compounds, Roofing Paint. J. W. Mortell Co., Kankakee, Ill.

Motorelay — Contact Device. Barber-Colman Co., Rockford, Ill.

Motorized Draft-O-Stat—Controls. Hotstream Heater Co., Cleveland.

Motorstoker—Stokers. Hershey Machine & Foundry Co., Manheim, Pa.

Mototurb—Ventilators. Uno Ventilator Co., Cliftondale, Mass.

Mule-Hide — Cement, Caulking Compounds, Paint and Roofing. Lehon Company, Chicago, Ill.

Multiblade—Welding Fume Exhausters. General Blower Co., Morton Grove, Ill.

Multiclone—Collectors. Western Precipitation Corp., Los Angeles, Calif.

Multi-Duty—Filters. American Air Filter Co., Inc., Louisville, Ky.

Multi-Flame—Gas Burners. American Gas Burner, Inc., Indianapolis, Ind.
Multiple Star — System of Welding. Electric Arc, Inc., Newark, N. J.
Multi-Speed—Thermostatic Blower Control. National Thermal Drive Co., Inc., St. Paul, Minn.
Multitherm — Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.
Multi-V — Belts. B. F. Goodrich Co., Akron, O.
Multi-V—Filters. Drico Industrial Corporation, New York City.
Multivane—Blowers. B. F. Sturtevant Co,, Hyde Park, Boston, Mass.
Multi-Zone—Conditioners. Micheli Air Conditioning Co., Inc., Schenectady, N. Y.
Murex—Arc Welding Electrodes. Metal & Thermit Corp., New York, N. Y.

N

Nairoil—Oil Burners. National Airoil Burner Co., Philadelphia, Pa.
National—Blowers, Furnaces. P. H. MaGirl Foundry & Furnace Wks., Bloomington, Ill.
National—Furnaces, Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.
National—Horizontal Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.
National — Water Heaters. Mustee Heater Co., Cleveland.
National - Champion — Furnaces. National Heater Co., Minneapolis.
Natroco — Paint. National Mfg. Corp., Tonawanda, N. Y.
Natur-Temp—Flame-proof Cotton Insulation. Barnhardt Manufacturing Co., Charlotte, N. C.
Naturzone—Board Insulation. Wilson & Co., Inc., Chicago, Ill.
Nebelastic—Roof Cement, Nebel Manufacturing Co., Cleevland.
Nebel-Kote — Paint. Nebel Manufacturing Co., Cleveland.
Nelson — Stokers. Heating Assurance, Spokane, Wash.
Never Slip — Conductor Fittings. Lacrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
New American — Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.
New Braze—Flux. Sherman & Co., New York City.
New Departure — Oil Burners. Aldrich Company, Wyoming, Ill.
New Detroit—Draft Gages. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.
Newmanco — Kalamein Doors, Grilles. Newman Brothers, Inc., Cincinnati, O.
Niagara—Furnaces, Blowers, Oil Burners. Forest City Foundries Co., Cleveland, O.
Nibco—Copper Tube Fittings. Northern Indiana Brass Co., Elkhart, Ind.
Nickelend — Electrodes. Arcos Corp., Philadelphia, Pa.
Nickeloid—Sheets. American Nickeloid Co., Peru, Ill.
Nickend — Electrodes. Arcos Corporation, Philadelphia.
Nicuend — Electrodes. Arcos Corporation, Philadelphia.
Nitenir—Night Air Cooling Fans. Lau Blower Co., Dayton, Ohio.
NoDrip—Insulation. J. W. Mortell Co., Kankakee, Ill.
No-Dust—Grinders. Hammond Machinery Builders, Inc., Kalamazo, Mich.
Noel—Arc Welders. The Ideal Electric & Mfg. Co., Mansfield, O.
No-Flex—Registers and Faces. Hart & Cooley Mfg. Co., Holland, Mich.
Nohum—Valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
Nokorode—Flux. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Non-Clogging — Spray Nozzles. Link Belt Co., Chicago, Ill.
Non-Con-Dux — Cement, Insulation, Paper, Paste. Grant Wilson, Inc., Chicago, Ill.
Non - Metallic — Registers. Standard Stamping & Perforating Co., Chicago, Ill.
Non-Spark—Mallets. New Plastic Corporation, Hollywood, Calif.
Non-Syphoning — Steel Roofing. Milcor Steel Co., Milwaukee, Wis.
Norblo—Blowers, Fittings, Collectors, Housing, Air Washers. Northern Blower Co., Cleveland, O.
Norco — Products. Northwestern Stove Repair Co., Chicago, Ill.
Norfolk — Furnaces, Heaters, Humudifiers. Sioux City Foundry and Boiler Co., Sioux City, Ia.
No-Rivet — Damper Regulators. Ohio Products Co., Cleveland, O.
Northland—Heaters. J. V. Patten Co., Sycamore, Ill.
Nor'wester — Blowers. Grand Rapids, Die & Tool Co., Grand Rapids, Mich.
No - Streak — Registers. Rock Island Register Co., Rock Island, Ill.
"No Tar In" — Roofing Paint. Rutland Fire Clay Co., Rutland, Vt.
Novoid—Bases, Insulation. Cork Import Corp., New York, N. Y.
Nu-Air—Blades, Fans, Louvres, Ventilators. Meier Electric & Machine Co., Indianapolis, Ind.
Nu-Alpina—Gravity Roof Ventilators. Milcor Steel Co., Milwaukee, Wis.
Nu Galv — Metal Protecting Paint. Southern States Iron Roofing Co., Savannah, Ga.
Nu-Grip—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.
Nu-Notch—Ventilators. Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Nupla Plastic — Mallets. New Plastic Corporation, Hollywood, Calif.
Nuvent—Ventilators. Aeolus Dickinson, Chicago, Ill.
Nutipe—Gas Conversion Burners. Columbia Burner Company, Toledo, O.
Nu-Wood—Rigid Insulation. Wood Conversion Co., St. Paul, Minn.

O

OK — Grinders. Hammond Machinery Builders, Inc., Kalamazoo, Mich.
O. P. — Stokers and Stoker-fired Furnaces. Pocahontas Fuel Company Incorporated, Cleveland, O.
Octopus, Jr.—Welding Fume Exhauster. Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Ohio Triple Twisted — Wire Hangers. Ohio Wire Products Co., Dover, Ohio.
Oil-Aire-Flo — Furnaces. Lennox Furnace Co., Marshalltown, Iowa.
Oil Chief — Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.
Oil-Economy — Oil-Burning Air-Conditioning Furnace. International Heater Co., Utica, N. Y.
Oil-Aire — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Oil "Fire"—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Oilfire Monogram — Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.
Oilfyre—Furnaces. Lennox Furnace Co., Marshalltown, Ia.
Oilifter — Fuel Oil Pump. Automatic Products Co., Milwaukee.
Oil Mizer—Furnaces. Floral City Company, Monroe, Mich.
Oil-n-Aire — Oil Burners. Aldrich Co., Wyoming, Ill.
Oil-O-Matic — Oil Burners, Furnaces. Williams Oil - O - Matic Division, Bloomington, Ill.
Olympic — Heaters, Washington Stove Works, Everett, Wash.
Olympic Bronze — Electrodes, Plates, Sheets. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
One-Minute—Furnaces. Worsham Company, Inc., St. Louis.
Out-O-Wall — Registers. Rock Island Register Co., Rock Island, Ill.
Ovaltube — Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Over-Glo — Space Heaters. Gas-Con Equipment Co., Waco, Tex.
Oxweld—Welding Apparatus. Linde Air Products Co., New York, N. Y.
Oxycuttend — Electrodes. Arcos Corporation, Philadelphia.
Ozite—Insulation. American Hair & Felt Co., Chicago, Ill.

P

PBA Unit—Utility Room Furnace. Dowagiac Steel Furnace Co., Dowagiac, Mich.
P and C—Roofing Felt. Proie & Coogan Heating Co., Pittsburgh.
P and C Elaterite—Roof Cement, Paint. Proie & Coogan Heating Co., Pittsburgh.
P-K—Punches, Screws. Parker-Kalon Corporation, New York, N. Y.
P & H—Cranes, Electrodes, Hoists, Arc Welders. Harnischfeger Corporation, Milwaukee, Wis.
P.I.V.—Gear. Link Belt Co., Chicago.
P & R — Air Conditioning Units, Furnaces. Pernot & Rich, Inc., Los Angeles, Calif.
Pacific—Furnaces. W. W. Rosebaugh Co., Salem, Ore.
Pacific—Blowers, Fans, Furnaces, Heaters. Naco Manufacturing Co., Huntington Park, Calif.
Pacific Hydraulic — Presses and Dies. Equipment Sales Co., Oakland, Calif.
Packaged Weather — Store Coolers. General Electric Co., Bloomfield, N. J.
Packard—Water Heaters. W. M. Dary Co., Long Beach, Calif.
Paintgrip — Sheets. American Rolling Mill Co., Middletown, Ohio.
Pak-Ice—Machines. Vilter Manufacturing Co., Milwaukee.
Palco Wool—Saferized—Insulation. Pacific Lumber Co., San Francisco, Calif.
Palmaire — Blowers. Palmer Mfg. Co., Phoenix, Ariz.
Panelray—Wall Heaters. Day & Night Mfg. Co., Monrovia, Cal.
Papico — Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.
Par—Compressors. Lynch Manufacturing Corp., Toledo, O.
Paramount — Flashing. Flemm Lead Company, Inc., Long Island City, N. Y.
Paramount — Hollow Metal Windows. Willis Mfg. Co., Galesburg, Ill.
Parasol—Spray Nozzles. Spraying Systems Co., Chicago, Ill.
Parco—Skylight Lifts. Park City Cornice Works, Inc., Bridgeport, Conn.
Parkerizing—Metal treating processes. Parker Rust-Proof Co., Detroit, Mich.
Payne-A-Vent — Fittings. Payne Furnace Co., Inc., Beverly Hills, Calif.
Payneheat—Heating Units. Payne Furnace Co., Inc., Beverly Hills, Calif.
Pecos—Low-Tin Solder. National Lead Co., New York City.
Peer — Welders, Welding Timers. Pier Equipment Mfg. Co., Benton Harbor, Mich.
Peerless—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.
Peerless—Blowers, Washers. New York Blower Co., Chicago, Ill.
Peerless—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.
Pemco — Stainless Firebox. Petroleum Equipment Mfg. Co., New Haven, Conn.
Penetrol—Paint. Flood Co., Cleveland.
Penfield—Water Heaters. John Wood Mfg. Co., Inc., Conshohocken, Pa.
Penglass — Round "Accelerator" Roof and "Relief" Ridge Ventilators. Pennsylvania Wire Glass Co., Philadelphia.
Penn-Aire — Furnaces. Union Mfg. Co., Boyertown, Pa.
Penn - Mount — Slate. Structural Slate Co., Pen Argyl, Pa.
Penn Packaged Heat—Air Conditioners, Oil Burners, Furnaces, Heaters. Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Pennpaint — Metal Protecting Paint. Pennsylvania Salt Mfg. Co., Philadelphia.
PennSalt—Rust Preventive Chemicals and Cleaners. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Pentco — Combination Snips and Punches. Penn Tool Company, Philadelphia, Pa.
Perfection—Eaves Trough Fittings and Accessories. Iwan Brothers, South Bend, Ind.

Perfection — Mineral Wool Insulation. Riverton Lime & Stone Co., Inc., Riverton, Va.
Perfection — Water Heaters. Combustion Eng. Co., Inc., Chattanooga, Tenn.
Perfection Senior—Water Heaters. Perfection Water Heater Co., Glendale, Calif.
Perfection Standard — Water Heaters. Perfection Water Heater Co., Glendale, Calif.
Permaglas—Water Heaters. A. O. Smith Corporation, Milwaukee.
Permo-Aire—Filters. Air Devices, Inc., New York, N. Y.
Perry—Damper Clips and Tips. Griswold Mfg. Co., Erie, Pa.
Pet—Oil Burners. Aldrich Co., Wyoming, Ill.
Petco — Baffles, Interlocking, Combustion Chambers. B. A. Peterson Co., Dowagiac, Mich.
Petro—Oil Burners, Furnaces and Water Heaters. Petroleum Heat & Power Co., Stamford, Conn.
Pexto—Metal Workers' Machines and Tools. Peck, Stow & Wilcox Co., Southington, Conn.
Pickle Polish—Stainless Cleaner. American Chemical Paint Co., Ambler, Pa.
Piedmont Heatmaster—Water Heaters. Combustion Eng. Co., Inc., Chattanooga, Tenn.
Piedmont Reddy-Hot—Water Heaters. Combustion Eng. Co., Inc., Chattanooga, Tenn.
Pilot — Fans and Motors. F. A. Smith Mfg. Co., Inc., Rochester, N. Y.
Pioneer—Controls. Master Electric Co., Dayton, O.
Pioneer—Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.
Pittsburgh — Conversion Gas Burner. Automatic Gas Equipment Co., Pittsburgh.
Planeweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Plastic - Calk — Caulking Compounds. Chamberlin Company of America, Detroit.
Plastic Elastigum — Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
Plastic PB—Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
Plastikroof—Roofing Paint. Evercrete Corporation, New York, N. Y.
Plastiktrim — Plastic Mouldings, Trim, and Tubing and Fittings. R. F. Werner Co., New York, N. Y.
Plastite — Caulking Compounds. U. S. Stoneware Co., Akron, O.
Plastoid—Compounds, Furnace Cement. Plastic Products Co., Detroit, Mich.
Playford—Stokers. Rosedale Fdy. & Machine Co., Pittsburgh.
Plexiform—Blowers. Bayley Blower Co., Milwaukee, Wis.
Plinvane—Grilles and Registers. Tuttle & Bailey, Inc., New Britain, Conn.
Plicast—Hearth Cement Refractories. Plibrico Jointless Firebrick Co., Chicago, Ill.
Plicast L-W-I — Insulating Refractory. Plibrico Jointless Firebrick Co., Chicago, Ill.
Plisulate—Insulating Cement. Plibrico Jointless Firebrick Co., Chicago.
Plunamelt—Stainless Clad Sheets. Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Polair—Air Conditioning Units. Pernot and Rich, Inc., Los Angeles, Calif.
Portovent — Flexible Hose. American Ventilating Hose Co., New York City.
Porto-Shear—Electric Shears. Van Dorn Electric Tool Co., Towson, Md., and Black & Decker Mfg. Co., Towson, Md.
Powerbilt — Exhausters. Power Engineering Co., Chicago.
"Power-Flex"—Stokers. Link-Belt Co., Chicago, Ill.
Power Krafter — Snips & Shears. Klenk's Aviation. Snips, Wilmington, Del.
Powerstat—Valves. Mercoid Corp., Chicago, Ill.
Power Vane—Pneumatic Grinders. Chicago Pneumatic Tool Co., New York City.
Precipitron — Automatic Air Filter. Westinghouse Electric, Cleveland.
Premier — Electrodes and Welding Rod. American Steel & Wire Co., Cleveland, Ohio.
Premier Automatik — Stoker-Fired Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.
Premier DeLuxe — Furnaces. Premier Furnace Co., Dowagiac, Mich.
Premier Master — Furnaces. Premier Furnace Co., Dowagiac, Mich.
Pre-Notch—Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.
Preprite — Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.
Prepwash—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.
President — Storage Water Heaters. Crown Heater Co., Compton, Calif.
Presstico—Furnace and Roof Cement, Compounds, Paint. Presstite Engineering Co., St. Louis, Mo.
Presteel—Metal Stampings. Worcester Pressed Steel Co., Worcester, Mass.
Presdwoods—Insulation Board. Masonite Corp., Chicago.
Presteel —Fan Housings. Commercial Shearing & Stamping Co., Youngstown, Ohio.
Prest-O-Lite — Soldering Coppers, Soldering Torches, Welding Equipment. Linde Air Products Co., New York, N. Y.
Prest-O-Weld—Oxy-Acetylene Welding Equipment, Torches. Linde Air Products Co., New York, N. Y.
Princo — Hygrometers, Psychrometers, Electric Relays, Thermometers and Thermostats. Precision Thermometer and Instrument Co., Philadelphia, Pa.
Properaire—Blowers. Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Protectolite — Thermostats. Sampsel Time Control, Inc., Spring Valley, Ill.
Protector—Snow Guards. David Levow, New York, N. Y.
Protectorelay—Electric Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pul-Air—Ventilators. Penn Ventilating Co., Philadelphia, Pa.
Pul-Air Ridge—Ventilators. Penn Ventilating Co., Philadelphia.
Pulverzone—Stokers. American Coal Burner Co., Chicago, Ill.
Punchawl—Tools. Hub Specialty Co., Somerville, Mass.
Punknh — Louvres. Kelvin-White Co., Boston, Mass.
Purnire—Blower-Filters. Kortz Blower Mfg. Co., Grand Rapids, Mich.
Pure-Dure—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.
Purox—Oxy-Acetylene Welding Equipment and Torches. Linde Air Products Co., New York, N. Y.
Pyralux—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.
Pyrobar—Roofing Tile. United States Gypsum Co., Chicago, Ill.
Pyrotron — Temperature Recorders. Bailey Meter Co., Cleveland, O.

Q

Q-Chrome—Insulating Cement. Quigley Company, Inc., New York, N. Y.
Q-Chromatic—Insulating Cement. Quigley Company, Inc., New York, N. Y.
Q-T Ductliner—Celotex Corp., Chicago, Ill.
Quad—Furnace Blowers. Trade-Wind Motorfans, Inc., Los Angeles.
Quadrill — Four-Position Turret Drill Head. Chicago Precision Equipment Co., Chicago.
Quaker Burnoil—Oil Burners, Furnaces and Heaters. Quaker Mfg. Co., Chicago, Ill.
Quaker City—Eaves Trough and Gutters, Conductor Fittings and Accessories, Pipe, Ridge Rolls and Ridging. Berger Brothers Company, Philadelphia, Pa.
Quantrol—Duct Turning Vanes. Register & Grille Mfg. Co., Inc., Brooklyn.
Queen City—Shears. Niagara Machine & Tool Works, Buffalo, N. Y.
Quick—Water Heaters. Security Mfg. Co., Kansas City, Mo.
Quick Acting — Screw Clamps. Horst Mehl Mfg. Co., Houston, Tex.
Quick Heat—A. C. Furnace. American Stove Co., Lorain, O.
Quick Heater—Oil Burners. Quick Furnace & Supply Company, Des Moines, Iowa.
Quick-Set—Dividers. Reiner & Campbell, Inc., Elizabeth, N. J.
Quickwork — Shears and Sheet Metal Machines. Whiting Corporation, Harvey, Ill.
Quiet Flame — Oil Burners. Volcano Burner Corp., New York City.
Quiet May—Oil Burners. May Oil Burner Div., Gerotor May Corp., Baltimore.
Quiet Zone—Blowers. Palmer Manufacturing Co., Phoenix, Ariz.
"Quilt"—Insulation. Samuel Cabot, Inc., Boston, Mass.

R

RGA—Welding Rod. Universal Welder Corporation, Cleveland.
RGB—Welding Rod. Universal Welder Corporation, Cleveland.
RGS—Welding Rod. Universal Welder Corporation, Cleveland.
R & G — Grilles, Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
r/h — Furnaces. Rybolt Heater Company, Ashland, Ohio.
R.I.W.—Paint and Waterproofing. Toch Bros., Inc., Elm Pk., S. I., N. Y.
R. I. W. Liquir Konkerit—Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.
R. I. W. Plug-A-Leak—Roofing Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.
R & I—Furnace Cement and Insulation Refractory & Insulation Corp., New York, N. Y.
R & M—Motors. Robbins & Myers, Inc., Springfield, O.
RPM—Paint and Roofing Steel. H. H. Robertson Co., Pittsburgh, Pa.
R-R-M — Hygrometers, Psychrometers. The Palmer Thermometers, Inc., Cincinnati, O.
R-U-F — Fans and Ventilators. Reed Unit-Fans, Inc., New Orleans, La.
Racine—Stokers. Nelson Bros. & Strom Co., Racine, Wis.
Radiant Comfort—Gas Burners. Van's Gas Burner Service, Detroit.
Radiation Discs—Stoker Baffles. Munn and Steele, Inc., Newark, N. J.
Radi-Ion—Ozone Apparatus. Montgomery Brothers, San Francisco, Calif.
Radolite—Insulating Cement and Refractories. Pyrolite Products Co., Cleveland, O.
Rainbow Mist—Nozzles. National Engineering & Manufacturing Co., Kansas City, Mo.
Raintite — Roof Ventilators. Aeolus Dickinson, Chicago, Ill.
Raipo—Sheet Metal Cutters. Ralph W. Poe, Canton, Ill.
Ramco — Chimney Caps and Tops, Ventilators. Royal-Apex Mfg. Corp., Brooklyn, N. Y.
Ransome-Forster — Gas Burners. Ransome Co., Emeryville, Calif.
Rawl-Anchors — Bolts. Rawlplug Company, Inc., New York, N. Y.
Rawl-Drive—Masonry Nails and Expansion Bolts. Rawlplug Co., Inc., New York. N. Y.
Rawl-Tapers—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.
Reactance Arc—Portable Welders. Miller Electric Mfg. Co., Inc., Appleton, Wis.
Reco—Coils. Roessing Mfg. Co., Pittsburgh, Pa.
Reco — Fans and Motors. Reynolds Electric Co., Chicago, Ill.
Recover—Water Heaters. Rheem Mfg. Co., New York City.
Recoy — Air Conditioning Units and Coils. Refrigeration Economics Co., Inc., Canton, O.
Red Devil — Furnace Cement. Pecora Paint Co., Philadelphia, Pa.

Redflash—Gas Burners. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Redi—Stokers. General Machinery Co., Spokane, Wash.
Redi-Nail—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.
Redi-Paint—Prime Paint for Galvanized Surfaces. Turco Products, Inc., Los Angeles, Calif.
Redi-Set — Rivet Squeezer. Whitney Metal Tool Co., Rockford, Ill.
Red Metallic — Roofiing Paint. Clinton Metallic Paint Co., Clinton, N. Y.
Red-Reading-Mercury — Hygrometers, Psychrometers and Thermometers. The Palmer Thermometers, Inc., Cincinnati, O.
Red Seal—Sheets. Benjamin Wolff and Company, Chicago, Ill.
Red Top — Thermostats. H-B Instrument Company, Philadelphia, Pa.
Red X—Cleaners and Polishers. Turco Products, Inc., Los Angeles, Calif.
Reformend — Electrodes. Arcos Corp., Philadelphia, Pa.
Rego—Brazing Torches. National Cylinder Gas Co., Chicago, Ill.
Rego—Flux. Bastian-Blessing Co., Chicago, Ill.
Reillaloy—Stove and Furnace Repairs. Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
Renu-Vent—Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.
Republic — Gas Conversion Burners. Autogas Corp., Chicago, Ill.
Republic-Taylor—Terne Roofing Plates. Republic Steel Corporation, Cleveland, Ohio.
Resiscote—Paint. Reilly Tar & Chemical Corporation, Indianapolis, Ind.
Rex—Bearings, Pillow Blocks, Blower-Filter Units, Blowers, Fan-Filter Units, Blower Wheels. Air Controls Inc., Cleveland, O.
Rex—Bearings, Couplings and Nozzles. Chain Belt Co., Milwaukee, Wis.
Rex-Airate — Fans, Ventilators. Air Controls, Inc., Cleveland.
Rex—Electric Water Heaters. Cleveland Heater Co., Cleveland.
Rex-Air-Pak—Blower Units. Air Controls, Inc., Cleveland, O.
Rexarc—Arc Welders. Sight Feed Generator Co., Richmond, Ind.
Rexco—Refractories. Rex-Roto Corporation, Detroit.
Rexide—Metal Protecting Paint. A. C. Horn Co., Inc., Long Island City, N. Y.
Rex-Tube — Flexible Duct Connectors. Chicago Metal Hose Corp., Maywood, Ill.
Rexvane — Blowers. B. F. Sturtevant Co., Boston, Mass.
Rex Vibra-Sorbers — Vibration Eliminating Metal Hose. Chicago Metal Hose Corporation, Maywood, Ill.
Rexwelders—Spot Welders. Rex Welder & Engineering Co., Kansas City, Mo.
Reyn - O - Cell — Insulation. Reynolds Metals Co., Richmond, Va.
Rezistal — Stainless Steels. Crucible Steel Co. of America, New York, N. Y.
Rhinamel—Enamels. Tropical Paint & Oil Co., Cleveland, O.
Rich-Con—Ventilators. A-J Mfg. Co., Kansas City, Mo.
Ridgolator — Ridge Roof Ventilator. Klauer Mfg. Co., Dubuque, Ia.
Rigidized — Metals. Rigid-Tex Corp., Buffalo.
Rincon-trol — Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Rip-o-Lin—Enamels. Glidden Company, Cleveland, O.
Rip-pi—Enamels, Lacquers and Paints. Hilo Varnish Corp., Brooklyn, N. Y.
Riverside—Furnaces. Des Moines Stove Repair Co., Des Moines.
Rivnut—Blind Fasteners. B. F. Goodrich Co., Akron, Ohio.
Robinson—Brakes, Presses and Dies, Punches. New Albany Machine Mfg. Co., New Albany, Ind.
Rollaire — Air Conditioning Furnaces. Hipoint Corp., Bellefontaine, O.
Roof Flange—Flashing. Eagle-Picher Co., Cincinnati, O.
Roofkoter — Paint. Tropical Paint & Oil Co., Cleveland, O.
Roof-Vent — Ventilators. Reed Unit-Fans, Inc., New Orleans, La.
Rotary — Gravity Ventilators. The Swartwout Co., Cleveland, O.
Roto—Insulating Cement and Combustion Chambers. Rex-Roto Corporation, Detroit.
Roto-Blast — Furnaces. Moncrief Furnace Co., Atlanta, Ga.
Roto-Clone—Dust Collectors. American Air Filter Co., Inc., Louisville, Ky.
Rotojet—Nozzles. Binks Mfg. Co., Chicago, Ill.
Roxaprene — Enamels and Lacquers. Roxaline Flexible Finishes, Inc., Elizabeth, N. J.
Royal—Caulking Compounds, Cement, Enamels, Lacquers, Waterproofing, Paint. A Wilhelm Co., Reading, Pa.
Royal—Furnaces. Hart & Crouse Corporation, Utica, N. Y.
Royal—Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Royalastic—Roof Cement. A. Wilhelm Co., Reading, Pa.
Royalbestos—Furnace Cement. A. Wilhelm Co., Reading, Pa.
Royal Blue — Furnace Brushes. Schaefer Brush Mfg. Co., Milwaukee, Wis.
Royal Clipper—Metal Cutter. C-B Tool Co., Lancaster, Pa.
Rubalt—Enamels, Lacquers and Paint. Alfred Hague & Co., Inc., Brooklyn, N. Y.
Rubalt RA — Paint. Alfred Hague & Co., Inc., Brooklyn.
Rubatex—Insulation. Virginia Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubber-in-Shear — Vibration Isolating Pads. Korfund Co., Long Island City.
Rubyfluid—Solder, Soldering Flux, Ruby Chemical Co., Columbus, O.
Rudico—Furnaces. Rudy Furnace Co., Dowagiac, Mich.
Rudisteel — Furnaces. Rudy Furnace Co., Dowagiac, Mich.
Rusco—Windows. Russell Co., F. C., Cleveland, Ohio.
Rust Bloc No. 20—Coating. Turco Products, Inc., Los Angeles.
Rustnil—Paints. National Engineering Products, Inc., Washington, D. C.
Rysdon—Ventilators. Sioux Steel Co., Sioux Falls, S. D.
Rystrom—Fuel Oil Pumps. Polo Pump Co., Polo, Ill.

S

S — Sheets. The Superior Sheet Steel Co., Canton, O.
S C — Furnaces, Heaters. Surface Combustion, Toledo, O.
S.D.T. — Freeze Proof — Coils. John J. Nesbitt, Inc., Philadelphia.
S-E—Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
SGP—Gas Conversion Burners. Security Manufacturing Co., Kansas City, Mo.
S. I. S. — Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
S-L — Bar Folders, Nibblers, Slitting Machines. St. Louis Tool Co., St. Louis, Mo.
S-N—Furnaces, Oil Burners, Stokers. Scott-Newcomb, Inc., St. Louis, Mo.
SRP—Metal Protecting Paint. L. Sonneborn Sons, Inc., New York, N. Y.
Safety Circle — Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Saf-T-Hook—Hoisting Hook. Eastern States Supply Co., Brooklyn.
Saginaw—Furnace. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Saf-Way — Ladder Brackets. Pioneer Tool Co., Racine, Wis.
St. Clair — Circulating Heaters. Enterprise Foundry, Inc., Belleville, Ill.
St. Louis — Stoker. Ormsby-Osterman Co., St. Louis, Mo.
Sair Seal — Insulating Cement. A. P. Green Fire Brick Co., Mexico, Mo.
Sal-Mo — Cement, Insulation, Pipe Coverings. Sall Mountain Co., Chicago, Ill.
Samco — Cement. Standard Asbestos Mfg. Co., Chicago, Ill.
Samco — Floor Furnaces and Space Heaters. Samuel Stamping & Enameling Co., Chattanooga, Tenn.
Sampson—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.
Sanders — Floor Furnace. Ford Blow Pipe & Manufacturing Co., Memphis, Tenn.
Sandy Mac — Water Heaters. EverHot Heater Company, Detroit.
Saran — Plastic Tubing and Fittings. Acadia Synthetic Products Div., Chicago, Ill. Commercial Plastics Co., Chicago.
Saratoga — Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Sauter—Time Switches. R. W. Cramer Co., Inc., Centerbrook, Conn.
Sav-Haf — Oil Burners. Aldrich Co., Wyoming, Ill.
Saw-Chief—Hack Saws. Chicago Precision Equipment Co., Chicago.
Sawdust "Fire"—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Saw-Gun — Power Saw. Mid-States Equipment Co., Chicago.
Schmidt—Soldering Coppers, Soldering and Brazing Torches. Minn - Kota Foundry & Mfg. Co., Fargo, N. D.
Sco - Co — Roof Cement, Compounds, Paint, Roofing and Waterproofing. Southport Paint Co., Savannah, Ga.
Scribus - Dividus — Scribers, Dividers, Calipers, Wiggler. Nork Products Co., Los Angeles.
Scroll-Pivoter—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.
Sea Lion — Leather Belting. Chicago Belting Co., Chicago.
Seal Master—Bearings. Stephens-Adamson Mfg. Co., Aurora, Ill.
Seal of Quality — Roofing. Columbia Steel Co., San Francisco, Calif.
Seal - Tite — Registers. Char-Gale Mfg. Co., Minneapolis, Minn.
Seamless—Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.
Season-stat—Limit Controls. L. J. Mueller Furnace Co., Milwaukee.
Security — Caulking and Roofing. National Mfg. Corp., Tonawanda, N. Y.
Seisme-Dampers — Vibration Isolating Bases. Korfund Co., Inc., Long Island City, N. Y.
Selectair—Air Conditioning Units and Oil Furnaces. S. T. Johnson Co., Oakland, Calif.
Selectric—Storage Water Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Self-Seal Re-Fil-Able — Filters. Research Products Corporation, Madison, Wis.
Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.
Seneca — Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Sensatherm — Thermostats. Mercoid Corp., Chicago, Ill.
Sensitrol — Electrical Relays. Weston Electrical Instrument Corp., Newark, N. J.
Sentinel—Floor Furnaces. Stoker-Lad Co., Tacoma, Wash.
Sentinel—Water Heaters. General Water Heater Corp., Burbank, Cal.
Sentry — Furnaces. Payne Furnace Co. Beverly Hills, Calif.
Series "H"—Coils. John J. Nesbitt, Inc. Philadelphia, Pa.
Series "W"—Coils. John J. Nesbitt, Inc., Philadelphia, Pa.
70 Serviceman—Recording Thermostat. Jas. P. Marsh Corp., Chicago, Ill.
Shawburnize—Gas Conversion Burners. Shaw Burner Company, Arkansas City, Kansas.
Shawnee—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Shearcutter—Tools. Fearless Tool Co., Los Angeles.
Sheetrock—Duct Board. United States Gypsum Co., Chicago, Ill.
Shield-Arc — Electrodes and Welders. Lincoln Electric Co., Cleveland, O.
Shock Absorbing—Pillow Blocks. Triangle Mfg. Co., Oshkosh, Wis.
Shower - Proof — Paint. Calbar Paint & Varnish Co., Philadelphia, Pa.

Shut-O-Vent — Louvers and Shutters. Reed Unit-Fans, Inc., New Orleans, La.

Sierra Air—Evaporative Air Conditioners. International Sales Co., San Francisco.

Sievert — Soldering Furnaces and Torches. J. A. Sanders, Fulton, N. Y.

Silbond—Electrodes. Universal Welder Corporation, Cleveland.

Silent—Furnace Blowers. Air Conditioning Equipment Co., Minneapolis, Minn.

Silent Air — Fans. Belanger Fan & Blower Co., Detroit, Mich.

Silentaire—Window Ventilator and Filter Units. Berger Mfg. Div., Republic Steel Corp., Canton, O.

Silent-Auburn—Oil Burners, Furnaces, Heaters. Auburn Burner Co., Auburn, Ind.

Silent Automatic—Shutters. Meyer Mfg. Co., Detroit, Mich.

Silentbiu — Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Silent Breeze—Ventilating Fans. Holcomb & Hoke Mfg. Co., Indianapolis.

Silentvane—Blowers. B. F. Sturtevant Co., Boston, Mass.

Sil-Fos—Solder. Handy & Harman, New York, N. Y.

Silicon Bronze — Bolts. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Siloy-Soder—Solder. L. B. Allen Co., Inc., Chicago, Ill.

Silver-Soder — Solder. L. B. Allen Co., Inc., Chicago, Ill.

Silver Steel—Saws. E. C. Atkins & Co., Indianapolis, Ind.

Silvertile—Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Silvo—Fuel Oil Tank Solvent. Petroleum Solvents Corporation, New York City.

Simplate—Pneumatic Hammer. Chicago Pneumatic Tool Co., New York, N. Y.

Simplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Sim-trol—Barometric Dampers. Simplex Mfg. Co., Fond du Lac, Wis.

Sioux—Drills, Grinders, Sanders. Albertson & Co., Inc., Sioux City, Ia.

Sirocco—Air Conditioning Units, Blowers, Fans, Ventilators, Washers. American Blower Corp., Detroit, Mich.

Sisalation—Reflective Insulation. Sisalkraft Co., Chicago.

SkilDrill — Electric Drill. Skilsaw, Inc., Chicago, Ill.

SkilGrinders — Electric Grinders. Skilsaw, Inc., Chicago.

SkilNibbler—Electric Cutters. Skilsaw, Inc., Chicago.

SkilSanders — Electric Sanders. Skilsaw, Inc., Chicago.

SkilShear — Electric Saws. Skilsaw, Inc., Chicago.

SkilTools — Portable Tools. Skilsaw, Inc., Chicago.

Slo-Speed — Motors. Sterling Electric Motors, Inc., Los Angeles.

Smith & Hemenway — Tools. Crescent Tool Co., Jamestown, N. Y.

Smith's — Cleat Benders. R. E. Smith, Waukegan, Ill.

Smith's — Torches, Welders and Equipment. Smith Welding Equipment Co., Minneapolis, Minn.

Smithway — Water Storage Heaters, Stokers, Welders. A. O. Smith Corp., Milwaukee.

Snap Action—Humidifier Valves. McDonnell & Miller, Chicago.

Snap-Clips—Spring Fastenings. Cuyahoga Spring Co., Cleveland.

Snaplok — Furnace Pipe. Reeves Steel & Mfg. Co., Dover, O.

Snap-Rite — Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.

Sno-Breze — Coils, Evaporative Coolers. Palmer Mfg. Corp., Phoenix, Ariz.

Sno-Fluf — Evaporative Cooler Mats. Palmer Mfg. Corp., Phoenix, Ariz.

Snug-Fit—Coils. Hotstream Heater Co., Cleveland, O.

Soder—Solder. L. B. Allen Co., Inc., Chicago.

Softweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Solar—Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.

Solaraire — Air Conditioning Furnace. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Solderprep — Flux for Steel. Neilson Chemical Co., Detroit, Mich.

Solex—Heat Insulating Windows. Pittsburgh Plate Glass Co., Pittsburgh.

Solid Comfort — Furnaces. May-Fiebeger Co., Newark, O.

Soroco — Chimney Caps and Tops. Southbridge Roofing Co., Southbridge, Mass.

So Salts — Flux. Turco Products, Inc., Los Angeles, Calif.

Southaire—Pipe Fittings, Stokers. E. E. Souther Iron Co., St. Louis, Mo.

Southern-Aire—Space Heaters. Southern Aircraft Co., Garland, Tex.

Southern Breeze—Gas Conversion Burners. Barnes Mfg. Co., Cleveland.

Sovaklor—Meal Protecting Paint. Socony Paint Products, New York, N. Y.

Sovalex—Metal Protecting Paint. Socony Paint Products, New York, N. Y.

Spacesaver—Heating Unit. Payne Furnace Co., Beverly Hills, Calif.

Spartan—Kitchen Exhaust Fan. F. A. Smith Mfg. Co., Rochester, N. Y.

Spartan — Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Special X—Flux. Industrial Service Laboratories, Milwaukee, Wis.

SpecO — Soldering Flux. Pfanstiehl Chemical Co., Waukegan, Ill.

Speedarc—Electrodes. Universal Welder Corporation, Cleveland, O.

Speed Clips — Spring Steel Fastenings. Tinnerman Products, Inc., Cleveland, Ohio.

Spee Dee — Coils. Air Controls, Inc., Cleveland, O.

Speed-heat — Furnaces. Marshall Furnace Co., Marshall, Mich.

Speed Nuts — Sheet Metal Fastenings. Tinnerman Products, Inc., Cleveland, Ohio.

Speed-Trol — Transmissions. Sterling Electric Motors, Inc., Los Angeles.

Speed-Up—Concrete Waterproofing Cement. Hilo Varnish Corp., Brooklyn, N. Y.

Speedweld — Mild Steel Welding Rods. Trindl Products, Ltd., Chicago.

Spider-Web—Filters. Wilson & Co., Inc., Chicago.

Spinner—Ventilators. Milcor Steel Co., Milwaukee, Wis.

Spiralok—Pulleys. Scientiae Tool Co., Dayton, O.

Spirovane—Ventilating Fans. Western Blower Co., Seattle, Wash.

Spitfire—Water Heater. Security Mfg. Co., Kansas City, Mo.

Sprague—Furnaces. Katelman Foundry & Mfg. Co., Council Bluffs, Ia.

Sprayit—Paint Guns, Humidifiers, Nozzles. Electric Sprayit Co., Sheboygan, Wis.

Spra-Rite — Nozzles. Binks Mfg. Co., Chicago, Ill.

Stable-Arc — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Stackmaster — Furnace Regulator. Campbell Eng. Co., Appleton, Wis.

Staidarc—Electrodes. Universal Welder Corporation, Cleveland, O.

Stainarc—Electrodes. Universal Welder Corporation, Cleveland, O.

Stainlend — Electrodes. Arcos Corporation, Philadelphia, Pa.

Stainloy — Electrodes. Acme Electric Welder Co., Los Angeles.

Stainweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Sta-Lok — Prefabricated Ducts and Duct Fittings. Chicago Furnace Supply Co., Chicago, Ill.

Stamco—Furnace Pipe, Fittings. Cincinnati Stamping Co., Cincinnati, O.

Stamco—Sheet and Plate Machinery. Streine Tool & Mfg. Co., New Bremen, Ohio.

Standard — Furnaces. Aladdin Heating Corp., Oakland, Calif.

Standard — Furnace. Farris Furnace Co., Springfield, Ill.

Standard — Furnaces. Home Furnace Co., Holland, Mich.

Standard—Furnaces. Williamson Heater Company, Cincinnati.

Standard — Ventilators. Allen Corp., Detroit, Mich.

Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.

Star—Hack Saw Blades. Clemson Bros., Inc., Middletown, N. Y.

Star—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

Statick — Ventilators. Hirschmann-Pohle Co., Inc., LeRoy, N. Y.

Staxausters — Ventilators. Allen Corporation, Detroit.

Staynew — Filters. Dollinger Corporation, Rochester, N. Y.

Steel Cable — V-Belts. Goodyear Tire & Rubber Co., Inc., Akron, O.

Steelcore — Galvanized Steel Shingles. Tennesseee Coal, Iron & Railroad Co., Birmingham, Ala.

Steel-Fin — Heating Coils. New York Blower Co., Chicago, Ill.

Steelmaster — Shingles and Tile. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Steelmesh—Registers. Green Colonial Furnace Co., Des Moines, Ia.

Steel Mixture—Refractories. McLeod & Henry Co., Inc., Troy, N. Y.

Steelweld — Brakes, Presses and Dies, Shears Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.

Sterling — Evaporative Coolers and Compressors. Reynolds Mfg. Co., Springfield, Mo.

Sterling Bender—Beading Machines. F. L. Robertson, Buffalo, N. Y.

Steward—Presses and Dies. Ward Machinery Co., Chicago, Ill.

Stic-Tite—Cement. Refractory & Insulation Corp., New York, N. Y.

Stil-Blade—Blades and Fans. Howry-Berg Steel & Iron Works, Denver, Colo.

Stilphen—Blades, Fans and Louvres. Howry-Berg Steel & Iron Works, Denver, Colo.

Stokabilt — Air Conditioning Stoker Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

Stok-A-Fire—Furnaces, Stokers. Automatic Firing Corporation, St. Louis.

Stok-A-Timer — Stoker Controls. Mercoid Corp., Chicago, Ill.

Stoker Fire — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Stoker-Oin — Stokers. Advance Appliance Co., Peoria, Ill.

Stokerator — Domestic Stokers. Northern Steel & Stoker Corp., Peoria, Ill.

Stokerelay—Relays. Minneapolis - Honeywell Regulator Co., Minneapolis, Minn.

Stokermatic — Furnaces and Stokers. Rheem Manufacturing Co., New York City.

Stokol - Hydraulic — Stokers. Stokol Stoker Co., Inc., Indianapolis, Ind.

Stokol - Mercury — Stokers. Stokol Stoker Co., Inc., Indianapolis, Ind.

Stonewall — Asbestos - Cement Board. Ruberoid Co., New York, N. Y.

Storm-Seal—Fittings. Lyon-Conklin & Co., Inc., Baltimore.

StormSeal — Roofing Steel. Columbia Steel Co., San Francisco, Calif., and American Steel and Wire Company, Cleveland.

Stormtight—Roof Cement. L. Sonneborn Sons, Inc., New York, N. Y.

Stowaway — Attic Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Strate-Edge — Eaves Trough and Gutters. Milcor Steel Co., Milwaukee, Wis.

Strato-Liminator—Air Diffusers. Wilster, Inc., Cleveland, O.

Streamaire — Air Conditioning Units. Young Radiator Co., Racine, Wis.

Stream-Flo — Ventilators. The Allen Corporation, Detroit, Mich.

Streamjet — Nozzles. Spraying Systems Co., Chicago.

Streamline—Furnaces. Aladdin Heating Corp., Oakland, Calif.

Streamline—Ridge Ventilators. H. H. Robertson Co., Pittsburgh, Pa.

Streamline—Tubing and Fittings Mueller Brass Co., Port Huron, Mich.

Streamlined — Oil Burners. Shedlove Oil Burners, Inc., Minneapolis.
Streekno — Register Packing. Excel Heating & Air Conditioning Co., Chicago, Ill.
Stubby—Floor Furnace. Holly Mfg. Co., Pasadena, Calif.
Sturdybender — Presses, Brakes. Cyril Bath & Co., Cleveland, O.
Sullarc—Electrodes. Universal Welder Corporation, Cleveland, O.
Sullivan—Draft Stabilizer. Cole-Sewell Engineering Co., Minneapolis.
Sunbeam — Furnaces, Blower - Filters, Oil Burners, Heaters and Humidifiers. American Radiator and Standard Sanitary Corp., Pittsburgh, Pa.
Sun-Blaze—Furnaces. Harvey-Whipple, Inc., Springfield, Mass.
Sunburst—Gas Burners. Taylor Appliance & Mfg. Co., Royal Oak, Mich.
Sun Fuel Master—Furnaces and Heaters. J. V. Patten Co., Sycamore, Ill.
Sunlight — Motors. Packard Electric Div., General Motors Corp., Detroit.
Sunrise—Gas and Oil Burners. Kais Sunrise Works, Detroit, Mich.
Super — Drill Grinders. Crandall Mfg. Co., Los Angeles.
Super—Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.
Super — Heaters. Evans Products Co., Detroit.
Super—Plastic Furnace Lining. Walsh Refractories Corp., St. Louis, Mo.
Super — Pneumatic Tools. Keller Tool Company, Grand Haven, Mich.
Super-Air — Registers. Green Colonial Furnace Co., Des Moines, Ia.
Superair — Air Conditioning Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.
Superair—Blower-Filter Units. The Majestic Co., Huntington, Ind.
Super Air Screws — Ventilating Fans. Marathon Electric Mfg. Corp., Wausau, Wis.
Super De Luxe—Heaters. Evans Products Co., Detroit.
Superfex—Furnaces. Heaters. Perfection Stove Co., Cleveland, O.
Superfin—Furnaces. American Fdry. & Furnace Co., Bloomington, Ill.
Super Firma — Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Superflux N. O. 215 — Soldering Flux. Paul Lewis Laboratories, Inc., Milwaukee, Wis.
Superhot—Water Heaters. SuperbO Mfg. Co., Los Angeles.
Superior — Enamels. Blue Ridge Talc Co., Inc., Henry, Va.
Superior—Furnaces. Naco Manufacturing Co., Huntington Park, Calif.
Superior—Blowers. American Foundry & Furnace Co., Bloomington, Ill.
Superior — Sheets. Continental Steel Corp., Kokomo, Ind.
Superior—Storage Water Heaters. Bastian-Morley, Inc., LaPorte, Ind.
Superlife — Furnace. Excelsior Steel Furnace Co., Chicago, Ill.
Superlow — Electrodes. Acme Electric Welder Co., Los Angeles.
Supermetic — Compressors. Servel, Inc., Evansville, Ind.
Super - Nickel — Fittings. American Brass Co., Waterbury, Conn.
Super-Por-Seal — Waterproofing. Truscon Laboratories, Detroit.
Super-Quiet—Oil Burners. Green Colonial Furnace Co., Des Moines, Ia.
Super Red Streak — Furnace Cleaners. National Super Service Co., Toledo, O.
Super Sioux — Ventilators. Sioux Steel Co., Sioux Falls, S. D.
Super - Spred — Stokers. Wm. Bros Boiler & Mfg. Co., Minneapolis, 14.
Supersteel—Furnaces. Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Super - Thermo — Refractory. Chicago Fire Brick Co., Chicago, Ill.
Super-X—Roofing Nails. Republic Steel Corporation, Cleveland, O.
Super X — Sheets. Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.
Supreme — Enamels. Blue Ridge Talc Co., Inc., Henry, Va.
Supreme—Furnaces. American Furnace & Foundry Co., Milan, Mich.
Supreme—Furnaces, Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
Supreme — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Supreme—Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.
Sure Draft—Chimney Tops. H. C. Little Burner Co., Inc., San Rafael, Calif.
Sure-Foot—Ladder Base. Akron Steel Sales, Inc., Akron, O.
Sureweld—Arc Welding Electrodes. National Cylinder Gas Co., Chicago, Ill.
Surfaceweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
SuVeneer — Clad Sheets. Superior Steel Corp., Pittsburgh.
Swanee — Galvanized Shingles. Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
Sylphon—Controls, Damper Regulators, Thermostats and Valves. Fulton Sylphon Co., Knoxville, Tenn.
Symentrex—Waterproofing. A. C. Horn Co., Inc., Long Island City, N. Y.
Symonds—Registers. Front Rank Furnace Co., Div., Liberty Foundry Co., St. Louis, Mo.
Synchron — Stoker Controls, Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.
Synchron "600" — Timing Machines and Motors. Hansen Mfg. Co., Inc., Princeton, Ind.
Synerogear—Motors. U. S. Electrical Motors, Inc., Los Angeles.

T

Tag—Controls, Humidistats, Hygrometers, Recorders, Psychrometers, Thermometers, Thermostats and Gas Pressure Regulating Valves. C. J. Tagliabue Div., Brooklyn, N. Y.
Tamanite — Metal Conditioner. Tamms Silica Company, Chicago, Ill.
Tamco—Ventilators. Tiffin Art Metal Co., Tiffin, Ohio.
Tampico—Filters. Chicago Filter Co., Joliet, Ill.
Tam - Putty — Caulking Compound. Tamms Silica Company, Chicago.
Tate—Furnaces. State Steel Products, Inc., Los Angeles.
Taylor — Roofing Ternes. Republic Steel Corporation, Cleveland, O.
Techni-Louvre — Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.
Tee Joint—Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.
Telemaster — Relays. Tork Clock Company, Inc., Mount Vernon, N. Y.
Tem-Clock — Controls. Penn Electric Switch Co., Goshen, Ind.
Temco — Furnaces. Tennessee Enamel Mfg. Co., Nashville, Tenn.
Temlok — Insulation. Armstrong Cork Co., Lancaster, Pa.
Tempered-Aire — Furnaces. Gar Wood Industries, Inc., Wayne, Mich.
Tempryte — Heat Insulating Windows. Truscon Steel Co., Youngstown, O.
Tempscribe—Portable Temperature Recorder. Bacharach Industrial Instrument Co., Pittsburgh.
Temtrol — Thermostats. Penn Electric Switch Co., Goshen, Ind.
10-Plastic—Caulking Compounds. Quigley Co., Inc., New York, N. Y.
Tension-Lap — Roofing Steel. Inland Steel Company, Chicago.
Tensulate—Insulation. Tennessee Products Corp., Nashville, Tenn.
Texrope—V-Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Tharco — Furnace Cement. The Armstrong Company, Detroit, Mich.
The Ambassador—Water Heaters. Lawson Mfg. Co., Pittsburgh.
The General—Furnaces. General Corporation, Minneapolis, Minn.
"The Pacific"—Furnaces. W. W. Rosebraugh Co., Salem, Ore.
Thermalfuel — Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.
Thermatic — Gas Conversion Burners. Wayne Home Equipment Co., Inc., Fort Wayne, Ind.
Thermek—Coils. Peerless of America, Inc., Marion, Ind.
Thermidaire — Air Conditioning Units, Blowers, Coils, Furnaces, Louvres & Shutters. E. K. Campbell Heating Co., Kansas City, Mo.
Thermix—Dust Collectors. Prat-Daniel Corporation, East Port Chester, Conn.
Thermo—Furnaces. American Furnace Co., St. Louis, Mo.
Thermo—Gas Soldering Furnace. Ward Machinery Co., Chicago, Ill.
Thermoanemometer — Anemometer, Willson Products, Inc., Reading, Pa.
Thermodraft—Draft Regulators. No-No Specialty Co., Cleveland.
Thermo - Draulic — Controls, Damper Motors and Regulators. Perfex Corporation, Milwaukee, Wis.
Thermo-Drip — Humidifier. Automatic Humidifier Co., Cedar Falls, Ia.
Thermodrive — Variable Speed Pulleys. Webster Electric Co., Racine, Wis.
Thermogas — Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.
Thermo-Grip—Soldering Coppers. Ideal Industries, Inc., Sycamore, Ill.
Thermo - Humidigraph — Humidity Recorders. Bristol Co., Waterbury, Conn.
Thermoil — Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.
Thermolux Standard Super — Water Heaters. Los Angeles Gas Appliance Co., Los Angeles.
Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.
Thermolux Super—Water Heaters. Los Angeles Gas Appliance Co., Los Angeles.
Thermopilot — Controls. General Controls Co., Glendale, Calif.
Thermomatic—Gas Conversion Burner. Willoughby Machine Co., Willoughby, Ohio.
Thermotite—Insulation. Coast Insulating Corp., Los Angeles, Calif.
Thin-Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Thor—Electric and Pneumatic Buffers, Nibblers, Hammers, Tools. Independent Pneumatic Tool Co., Chicago.
Thoro - Fine — Stoker Drive. Merkle-Korff Gear Co., Chicago.
3-M—Grinding and Finishing. Minnesota Mining & Manufacturing Co., St. Paul.
Three-Phase — Welders. Sciaky Bros., Chicago.
3000—Refractories. Refractory & Insulation Corporation, New York, N. Y.
370 Special — Paints. Thompson & Co., Pittsburgh, Pa.
Thrift—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Throway—Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.
Tik Wheat—Pipe Covering Paste. Clark Stek-O Corp., Rochester, N. Y.
Tilco-Fin — Coils. Extended Surface, Inc., Brooklyn.
Tillery's — Furnace Clock. Little Janitor Furnace Clock Co., New York, N. Y.
Timercoid—Time Clock. Mercoid Corp., Chicago, Ill.
Timerelay — Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Time-Saver—Damper Quadrants. Goese Mfg. Co., Milwaukee, Wis.
Timetrol — Switches. Penn Electric Switch Co., Goshen, Ind.
Ti-Namel — Vitreous Enameling Alloy Steel Sheets. Inland Steel Co., Chicago.
Tinezy — Solder. Farrelloy Co., Inc., Philadelphia.
Tinol—Soldering Flux. American Solder & Flux Co., Philadelphia, Pa.
Titelock—Fittings and Accessories for Conductor, Eaves Trough and Gutter, Furnace Pipe, Copper Roofing. Milcor Steel Co., Milwaukee, Wis.
TiteSeal—Caulking Compounds. Radiator Specialty Co., Charlotte, N. C.
Tobin Bronze—Plates and Welding Rod. American Brass Co., Waterbury, Conn.
Toncan Iron — Roofing, Sheets, Republic Steel Corp., Cleveland, O.
Toolarc — Electrodes. Universal Welder Corp., Cleveland, O.

Toolweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Toridaire — Furnaces. Fraser and Johnston Co., San Francisco, Calif.
Torid-Cast — Refractories Walsh Refractories Corp, St. Louis, Mo.
Toridheet — Blower - Filters, Burners, Furnaces and Heaters. Cleveland Steel Products Corp., Cleveland.
Toridmaster — Conversion Burners. Modern Controls Corporation, Detroit.
Tornado — Furnace Vacuum Cleaners. Breuer Electric Mfg. Co., Chicago, Ill.
Torrid — Soldering Furnaces and Torches. Geo. W. Diener Mfg. Co., Chicago, Ill.
Torrid Zone — Furnaces. Lennox Furnace Co., Marshalltown, Ia.
Totalume — Aluminum Paint. Wilbur & Williams Co., Boston.
Totrust — Paints, Enamels. Wilbur & Williams Co., Boston.
Townley — Ventilators. A-J Mfg. Co., Kansas City, Mo.
Transite—Duct Board, Pipe and Fittings. Johns-Manville, New York, N. Y.
Transparent—Air Filter Gauge. F. W. Dwyer Mfg Co., Chicago, Ill.
Trico — Furnaces. Tri-State Heating Supply Co., Fort Wayne, Ind.
TriCore — Solder. Alpha Metals, Inc,, Brooklyn.
Tri-Flux — Soldering Flux. Wolfe-Kote Co., Sheboygan, Wis.
Trimmer Dampers — Barometric Draft Control. Campbell Engineering Co., Appleton, Wis.
Trimtherm—Thermostats. General Controls Co., Glendale, Calif.
Trindl Arc—Torches. Trindl Products, Ltd., Chicago.
Trindl Super — Arc Welders. Trindl Products, Ltd., Chicago.
Triple A — Paints, Enamels and Lacquers, Compounds. Quigley Co., Inc., New York, N. Y.
Triple Drain—Channel Roofing. Republic Steel Corp., Cleveland, O.
Triple Lock—Roofing Nails. The Deniston Co., Chicago, Ill.
Triplex—Furnaces. Home Furnace Co., Holland, Mich.
Tripi-life — Furnaces. Williamson Heater Co., Cincinnati, O.
Tri-Rib — Steel Roof Deck. Wheeling Corrugating Co., Wheeling, W. Va.
Triumph — Water Heaters. Koil-Les Heater Co., Geneva, Ill.
Trojan—Furnaces and Stokers. Auburn Burner Co, Auburn, Ind.
Tropic Breeze — Furnaces. Dalzen Tool & Manufacturing Co., Detroit, Mich.
Tuberator — Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.
Tuffaloy—Electrodes. Welding Sales & Engineering Co., Detroit.
Tuffy — Power-Arm Drivers. Swallow Airplane Co., Wichita, Kans.
Tuffernell — Paint. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Tulox—Plastic Tubing. Extruded Plastics, Inc., Norwalk, Conn.
Turbo — Air Washers, Spray Nozzles. Bayley Blower Company, Milwaukee, Wis.
Turbovane — Blowers. B. F. Sturtevant Co., Boston, Mass.
Twin Contact — Controls, Relays, Thermostats. Perfex Corporation, Milwaukee, Wis.
Twin-Fyre — Oil Burner. Aldrich Co., Wyoming, Ill.
Two-Drain — Steel Roofing. Milcor Steel Co., Milwaukee.
Two-Way—Pneumatic Hammer. Coast Pneumatic Tool Co., Los Angeles.
Tygon — Metal Protecting Paint. U. S. Stoneware Co., Akron, Ohio.
Tyi-Lyke — Steel Roofing and Siding. Continental Steel Corp., Kokomo, Ind.
Tymotherm — Thermostats. Tork Clock Company, Inc., Mount Vernon, N. Y.
Type X — Stainless Cleaner. Turco Products, Inc., Los Angeles, Calif.
Typhoon—Air Conditioners, Coils, Ice, Air Conditioning Co., Inc., Brooklyn.

U

U-Alloy — Electrodes. Universal Welder Corporation, Cleveland.
U.S.—Pipe Fittings, Grilles, and Registers. United States Register Co., Battle Creek, Mich.
USG—Built-Up Roofing and Roof Cement and Paint. United States Gypsum Co., Chicago, Ill.
U.S.S. — Nails, Roofing, Sheets, Plates, Wire. Subsidiaries, U. S. Steel Corporation.
U.S.S. American — Nails. American Steel & Wire Co., Cleveland, O.
U.S.S. Carilloy—Alloy Plates. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
U.S.S Columbia — Roofing, Sheets. Columbia Steel Co., San Francisco, Calif.
U.S.S Paintbond — Sheets Carnegie-Illinois Steel Corporation, Pittsburgh, Pa.
U.S.S. Stormseal — Steel Roofing. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
U.S.S. Tenneseal — Roofing. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
U.S.S. Vitrenamel — Sheets Carnegie Illinois Steel Corporation, Pittsburgh, Pa.
Ucilon — Coatings and Paint. United Chromium, Incorporated, New York City.
U-Loy — Sheets. Republic Steel Corp., Cleveland, O.
UMCO—Furnaces. Union Manufacturing Co., Boyertown, Pa.
"U" Tube — Water Heaters. Handley Brown Heater Co., Jackson, Mich.
Una-Flo — Water Heaters. Sunshine Mantle Co., Chanute, Kansas.
Uniclosed—Motors. U. S. Electrical Motors, Inc., Los Angeles.
Uniduct—Prefabricated Ducts. General Corporation, Minneapolis, Minn.
Unifil—Insulation. Robinson Insulation Co., Great Falls, Mont.
Uni-Fin—Grilles and Warm Air Registers. Barber-Colman Co., Rockford, Illinois.
Uni-flo — Duct Turning Vanes, Grilles and Registers. Barber-Colman Company, Rockford, Ill.
Uniflo—Filters. Continental Air Filters, Inc., Louisville, Ky.
Unilloy—Stainless Steel Sheets. Universal-Cyclops Steel Corp., Bridgeville, Pa.
Unipack—Blowers, Exhausters. American Machine Products Co., Marshalltown, Iowa.
Unique—Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago, Ill.
Unishear — Portable Electric Shears. Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Unisorb—Bases and Pads and Duct Insulation. Felters Co., Boston, Mass.
Unitaire — Air Conditioning Units for Stores. B. F. Sturtevant Div., Westinghouse Electric, Boston
Universal — Angle Benders. Hossfeld Mfg. Co., Winona, Minn.
Universal—Dial Damper Parker-Kalon Corp, New York, N. Y.
Unxld — Damper Quadrants. Parker-Kalon Corp., New York, N. Y.
Upson — Rivets, Bolts Republic Steel Corp, Cleveland, O.
usAIRco — Air Conditioning Units, Blowers and Blower-Filter Units, Coils, Fans, Grilles, Washers and Blower Wheels. U. S. Air Conditioning Corp., Minneapolis.
Utilifurnace — Air Conditioning Furnaces. Ingersoll Steel & Disc Div., Chicago.
Utilus—Kitchen Exhaust and Ventilating Fans. Hischman-Pohle Co., Inc., LeRoy, N. Y.

V

V-Drain — Roofing. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
V-Vent — Ventilators. Aeolus Dickinson, Chicago, Ill.
Vackar — Furnace Vacuum Cleaners. Black & Decker Mfg. Co., Towson, Md.
Vacu-Draft — Forced Draft Blowers. Muncie Gear Works, Inc., Muncie, Ind.
Valcalox — Damper Regulators. Young Regulator Co., Cleveland, O.
Valdura — Caulking Compounds, Paint. American-Marietta Co., Chicago, Ill.
Valley Forge—Cement. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Vanatta Qwikheat — Electric Soldering Iron. Sound Equipment Corp., Glendale, Calif.
Vanco Duratite — Skylights. E. Van Noorden Co., Boston.
Vanco Syphon — Ventilators. E Van Noorden Co., Boston.
Vanco Superflo — Ridge Ventilators. E. Van Noorden Co., Boston.
Vanco Upblast — Ventilators. E. Van Noorden Co., Boston.
Vapoglas — Humidifier Evaporating Plates. Skuttle Mfg. Co., Detroit, Mich.
Varidrive — Motors. U. S. Electrical Motors, Inc., Los Angeles.
Vari-Pitch — Speed Changers Allis-Chalmers Mfg. Co., Milwaukee.
Veejet — Nozzles. Spraying Systems Co., Chicago.
Veelos — Adjustable V-Belts. Manheim Mfg. & Belting Co., Manheim, Pa.
Velometer—Anemometers. Illinois Testing Laboratories, Inc., Chicago, Ill.
Venetian—Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.
Ventair — Fans. West Wind Corporation, Seattle.
Ventalarm—Fuel Tank Signal. Scully Signal Company, Cambridge, Mass.
Ventilette — Fans. Diehl Manufacturing Company, Somerville, N. J.
Ventube—Rubberized Tubing. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
Venturn—Fans, Ventilators. American Blower Corp., Detroit, Mich.
Venturi-Flo — Air Diffusers. Ceiling Ventilators, Duct Turning Vanes. Barber-Colman Company, Rockford, Ill.
Vernois — Furnaces and Heaters. Mt. Vernon Furnace and Mfg. Co., Mt. Vernon, Ill.
Versalend—Electrodes. Arcos Corporation, Philadelphia.
Versa-Tool — Portable Electric Drill. York Electric and Machine Co., York, Pa.
Verti-Bay — Coils. Vilter Manufacturing Co., Milwaukee.
Vibra-Cork—Vibration Isolating Bases. Korfund Co., Inc., Long Island City, N. Y.
Vibrashock—Vibration Isolating Pads. Robinson Aviation, Inc., Teterboro, N. J.
Vibro-Bars—Vibration Isolating Bases. Korfund Co., Inc., Long Island City.
Vibro-Dampers — Vibration Isolating Bases. Korfund Co., Inc., Long Island City.
Vibro - Insulators — Vibration Insulating Pads. B. F. Goodrich Co., Akron, O.
Vibro - Isolator — Vibration Isolating Bases, Korfund Co., Inc., Long Island City.
Victor—Blower-Filter Units, Furnaces, Humidifiers, Oil Burners, Stokers. Hall-Neal Furnace Co., Indianapolis, Ind.
Victoraire — Winter Air Conditioners. Hall-Neal Furnace Co., Indianapolis, Ind.
Victorgas — Gas Units. Hall-Neal Furnace Co., Indianapolis, Ind.
Victor Jumbo — Large Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.
Victoroil — Air Conditioning Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.
Victorstoke — Stoker Units. Hall-Neal Furnace Co., Indianapolis, Ind.
Victory—Oil Burners. Caloroil Burner Corp., Hartford, Conn.
Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Victron—Fans, Motors. Victor Electric Products, Inc., Cincinnati.
Vigoraire—Furnaces. Marshall Furnace Co., Marshall, Mich.
Vik-O-Matic — Stokers. Viking Manufacturing Corporation, Cleveland.
Vincul—Rustproofing. Protective Coatings, Inc., Detroit.
Visaflame — Oil Burner Controls. Mercoid Corp., Chicago, Ill.
Vita-Aire—Ozone Apparatus. A & J Co., Chicago.
VitaRay — Space Heaters. Quad Stove Mfg. Co., Columbus, O.

Vitra-Carlite — Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Vitriset—Furnace Cement. U. S. Stoneware Co., Akron, Ohio.
Vitroliner — Vent and Flue Pipe and Fittings. Condensation Engineering Corp., Chicago, Ill.
Volcano—Chimney Caps and Tops, Ventilators. Iwan Brothers, South Bend, Ind.
Volocitrol — Stack-Head Damper. Barber-Colman Co., Rockford, Ill.
Vortex—Furnace Vacuum Cleaners. B. F. Sturtevant Co., Hyde Park, Boston, Mass.
Vortex—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York City.
Vulcan—Stokers. Canton Stoker Corp., Canton, O.
Vulcanite — Roofing, and Roofing Cement. Certain-teed Products Corp., New York City.
Vulcatex—Caulking and Glazing Compounds. A. C. Horn Co., Inc., Long Island City, N. Y.
Vulco—V-type Belts and Pulleys. Gates Rubber Co., Denver, Colo.

W

W—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.
WAW—Tools. W. A. Whitney Mfg. Co., Rockford, Ill.
W. O. No 1 — Rust Preventive Chemicals. Turco Products, Inc., Los Angeles, Calif.
Warco — Refractories. Walsh Refractories Corp., St. Louis, Mo.
Ward Zephyr—Attic Fans. Edgar T. Ward Co., Inc., River Forest, Ill.
Warmahl — Furnaces. Mahl Mfg. Co., Huntington Park, Calif.
Warrior — Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.
Wateo — Spray Nozzles. Water Cooling Corp., New York City.
Waterbase — Furnaces. Farris Furnace Co., Springfield, Ill.
Water-Boy — Humidifier Valves. Maid-O'-Mist, Inc., Chicago, Ill.
Waterbury — Oil Burners, Ducts and Fittings, Pipe, Pipe Fittings and Accessories, Furnaces, Blowers. Waterman - Waterbury Co., Minneapolis, Minn.
Water Hot — Water Heaters. Security Mfg. Co., Kansas City, Mo.
Water - RAY - troln — Oil-fired Water Heater. Ray Oil Burner Co., San Francisco, Calif.
Waterseal — Cement. Thompson & Co., Pittsburgh, Pa.
Waterspar — Enamels and Lacquers. Pittsburgh Plate Glass Co., Pittsburgh.
Watertender—Humidifier Valve. Skuttle Mfg. Co., Detroit, Mich.
Watoreoil—Waterproofing. A. C. Horn Co., Inc., Long Island City.
Wearweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Weathercote — Waterproofing Compounds. Glidden Co., Cleveland, O.
Weathermakers — Air Conditioning Units. Carrier Corp., Syracuse, N. Y.
Weather-Man — Weather Compensating Thermostats. Automatic Devices Co., Chicago.
Weatherwood — Insulation. United States Gypsum Co., Chicago, Ill.
Webster—Air Washers. W. J. Strandwitz & Co., Inc., Camden, N. J.
Wedgbelt—Belts and Pulleys. American Pulley Co., Philadelphia, Pa.
Weir — Air Conditioning Furnaces, Gravity Furnaces, Heaters, Humidifiers, Stokers. Meyer Furnace Co., Peoria, Ill.
Weiralead — Sheets. Weirton Steel Co., Weirton, W. Va.
Weircoloy—Copper Bearing Galvanized Sheets. Weirton Steel Co., Weirton, W. Va.
Weirite—Tin Plate. Weirton Steel Co., Weirton, W. Va.
Weir - Meyer Heat — Furnaces. Meyer Furnace Co., Peoria, Ill.
Weirzin — Electrolitic Zinc Coated Sheets. Weirton Steel Co., Weirton, W. Va.
Weisco — Skylight Lifts. H. Weiss & Co., New York, N. Y.
Weld-A-Cast—Soldering Flux. Universal Welder Corporation, Cleveland.
Weldmaster—Brazing Torches. Modern Eng. Co., St. Louis.
Weldon—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Weld-o-trol — Spot Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Weld-O-Tron—Arc Welders. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Wellsville Savage—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.
Wesco — Blower Filters. Northwest Foundry & Furnace Co., Inc., Portland, Ore.
Wesco — Furnaces. John Westwick & Son, Inc., Galena, Ill.
Wesco—Furnaces. General Wesco Stove Co., Springfield, Mo.
Wesco Diamond — Furnaces. Northwest Foundry & Furnace Co., Portland, Ore.
Wesco Duplex—Utility Room Furnaces. Northwest Foundry & Furnace Co., Portland, Ore.
Wesco Hiboy — Furnaces. Northwest Foundry & Furnace Co., Inc., Portland, Ore.
West Aire — Furnaces. Harry F. Haldeman, Inc., Los Angeles.
Western — Blowers, Furnaces. International Sales Co., San Francisco.
Western—Water Heaters. W. B. Bastian Mfg. Co., Los Angeles.
Western Fan — Roof Fan Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Western King—Furnaces. Independence Stove & Furnace Co., Independence, Mo.
Western Turbine—Gravity Roof Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Westernaire Exhausters — Ventilating Fans. Western Engineering & Mfg. Co., Los Angeles, Calif.
Westmoreland — Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Westwind—Fans. West Wind Corporation, Seattle.
Wetoil—Soldering Flux. Farrelloy Co., Inc., Philadelphia.
Whirlator — Oil Burners. Norge Heat Div., Borg-Warner Corp., Detroit.
Whirlcone — Spray Nozzles. Water Cooling Equipment Corp., St. Louis, Mo.
Whirljet—Spray Nozzles. Spraying Systems Co., Chicago, Ill.
Whitney - JENSEN — Angle Benders, Brakes, Punches, Shears and Tools. Whitney Metal Tool Co., Rockford, Ill.
Wiechert—Furnaces, Heaters. St. Clair Foundry Corp., Centralia, Ill.
Wilhelm — Furnace Cement. Glidden Co., Cleveland, O.
Wilson — Arc Welders. Air Reduction Sales Company, New York City.
Wilson — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.
Wind Electric — Roof Ventilators. Hirschman - Pohle Co., Inc., LeRoy, N. Y.
Wind-O-Cool—Fans. Belco Exhaust Fan Mfg. Co., St. Louis.
Wind-O-Vent — Fans. Diehl Manufacturing Company, Somerville, N. J.
Wind-O-Vent — Ventilator Units. Reed Unit-Fans, Inc., New Orleans, La.
Wingfoil—Fans, Ventilators. L. J. Wing Mfg. Co., New York City.
Winkler—Stokers. U. S. Machine Corporation, Lebanon, Ind.
Winter-Chaser — Furnaces, Heaters. Campbell Heating Co., Des Moines, Ia.
Winter King — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
Wisso—Perforated Metals, Wire. Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Witch—Bolts. Carpenter & Paterson, Inc., East Boston, Mass.
Wizard — Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.
Wolfe—Angle Meter, Circle Meter, Divizor, Protractor. Interstate Sales Co., New York City.
Wolverine—Fans, Exhausters, Ventilators. Belanger Fan & Blower Co., Detroit, Mich.
Wolverine — Furnaces. Marshall Furnace Co., Marshall, Mich.
Wonderflux—Flux. Sherman & Co., New York City.
Woods — Hack Saws. Howes - Woods Company, Cambridge, Mass.
Woolfelt — Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Wrigley—Gas Burners. Jackson Heating Co., Jackson, Mich.
Wyandotte—Furnaces. American Radiator & Standard Sanitary Corporation, Pittsburgh.
Wyco — Flexible Shaft Machines. Wyzenbeck & Staff, Inc., Chicago.
Wycoflex—Grinder. Wyzenbeek & Staff, Inc., Chicago.

X

XL — Metal Windows. Herrmann & Grace Co., Brooklyn, N. Y.
X-L-All — Furnaces. Deshler Foundry & Machine Works, Deshler, Ohio.
Xcel - Flux — Electrodes. Universal Welder Corporation, Cleveland.
Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
X - Pandoseal — Transparent Waterproofing. X-Pando Corp., Long Island City.
XX—Punches. Parker-Kalon Corp., New York.

Y

Yager's — Flux. Alex R. Benson Co., Inc., Hudson, N. Y.
Yale—Water Heaters. W. B. Bastian Mfg. Co., Los Angeles.
Yankee — Damper Clips and Tips. Howes - Woods Company, Cambridge, Mass.
YarWay—Nozzles. Yarnall-Waring Co., Philadelphia, Pa.
Yearound — Air Conditioning Units. Conditionaire Unit Co., Chicago, Ill.
Yoloy — Plates. Youngstown Sheet & Tube Co., Youngstown, Ohio.
Yorkaire Conditioners — Air Conditioning Units. York Corp., York, Pa.
YouBert — Collectors and Blow Pipe Fittings. Young & Bertke Co., Cincinnati, O.

Z

Zeph-Air — Gas Furnace. XXth Century Heating & Ventilating Co., Akron, O.
Zephair — Ventilating System. Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
Zeph-Oil-Ator — Air Conditioning Furnaces. Century Engineering Corp., Cedar Rapids, Ia.
Zephyr—A. C. Stoker Furnace. Premier Furnace Co., Dowagiac, Mich.
Zephyr—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Zephyr—Saws. DoAll Company, Minneapolis.
Zephyr Jet — Gas Conversion Burners. Zephyr Burner Company, Ferndale, Mich.
Zero—Cement and Refractories. Standard Fuel Engineering Co., Detroit, Mich.
Zilloy—Zinc Roofing. New Jersey Zinc Co., New York City.
Zinc Chromate Primer — Metal Protecting Paint. Hilo Varnish Corp., Brooklyn, N. Y.
Zincgrip—Steel Sheets. American Rolling Mill Co., Middletown, O.
Zoneair—Furnaces. Payne Furnace Co., Inc., Beverly Hills, Calif.
Zono—Combustion Chambers. Robinson Insulation Co., Great Falls, Mont.
Zonolite — Cement Combustion Chambers. Insulation. Universal Zonolite Insulation Co., Chicago; and Munn and Steele, Inc., Newark, N. J.
Zonolite — Insulation. Robinson Insulation Co., Great Falls, Mont.
Zonolite — Insulation. Western Mineral Products Co., Omaha, Nebr.
Zura—Roofing Paint. L. Sonneborn Sons, Inc., New York City.

Section of

American Artisan

1947 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 3 — MANUFACTURERS' ADDRESSES]

A

- A-J Manufacturing Co., 2119 Washington St., Kansas City 8, Mo.
- A & J Company, 844 W. 59th St., Chicago 21.
- Abbott Mfg. Co., Drawer 150, Painesville, O.
- Acadia Synthetic Products Div., Western Felt Works, 4115 Ogden Av., Chicago 23.
- Accurate Mfg. Works, 2336-38 Milwaukee Av., Chicago 47.
- Acer & Whedon, Inc., Commercial St., Medina, N. Y.
- Acet-A-Tips Company, 5069 W. Madison St., Chicago 44.
- Ackermann Manufacturing Company, Wheeling, W. Va.
- Acme Asbestos Covering & Flooring Co., 222 Elizabeth St., Chicago 7.
- Acme Electric Heating Co., Inc., 1205 Washington St., Boston 18.
- Acme Electric Welder Co., 2618 Fruitland Rd., Los Angeles 11.
- Acme Equipment Co., Inc., 126 S. Clinton St., Chicago 6.
- Acme Furnace Fittings Co., 8219 S. Racine Av., Chicago.
- Acme Industries, Inc., Mechanic & Ganson Sts., Jackson, Mich.
- Acme Oil Burner Co., Inc., 210 Third Av. S. W., Cedar Rapids, Ia.
- Acme Tin Plate & Roofing Supply Co., 3rd & Westmoreland Sts., Philadelphia 40.
- Acme Wire & Iron Works, Canfield & Moran, Detroit 7.
- Adams Bros. Mfg. Co., Inc., 1500 W. North Av., Pittsburgh 12.
- Adams Co., The, Bridge St., Dubuque, Ia.
- Adams Manufacturing Co., 11226 Superior Av., Cleveland 6.
- Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago 32.
- Advance Appliance Co., Inc., 2400 S. Adams St., Peoria, Ill.
- Advance Furnace Company, 2300 E. Douglas, Wichita 7, Kansas.
- Aeolus Dickinson, 3320 S. Artesian Av., Chicago 8.
- Aerofin Corp., 410 S. Geddes St., Syracuse 1, N. Y.
- Aeroil Products Co., Park Ave. at 57th St., West New York, N. J.
- Aeroquip Corp., East St., Jackson, Mich.
- Aerotec Company, 61 Westchester Av., White Plains, N. Y.
- Aerovent Fan Co., 710 E. Ash St., Piqua, O.
- Aget-Detroit Co., 602 First National Bank Bldg., Ann Arbor, Mich.
- Agnew Electric Co., Milford, Mich.
- Agricola Furnace Co., Inc., North 12th St., Gadsden, Ala.
- Ahlberg Bearing Co., 3012 W. 47th St., Chicago 32.
- Air Conditioning Equip. Co., P. O. Box 1123, Minneapolis 1.
- Air Conditioning Products Company, 2340 W. Lafayette Blvd., Detroit 16.
- Air Conditioning and Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
- Air Control Products, Inc., Coopersville, Mich.
- Air Controls, Inc., 2310 E. Superior Av., Cleveland 14.
- Air Devices, Inc., 17 E. 42nd St., New York City 17.
- Airecon Industries, 2536 Fourteenth St., Detroit 16.
- Air Filter Corporation, 2154 W. Lisbon Av., Milwaukee 5.
- Air Filter Engineering Co., 2450 S. Prairie Av., Chicago 16.
- Airgard Manufacturing Co., 362 W. Erie St., Chicago 10.
- Airkem, Inc., 234 E. 46th St., New York 17.
- Airmaster Corp., 4317 Ravenswood Av., Chicago 13.
- Air-Maze Corp., 5200 Harvard Av., Cleveland 5.
- Air Products, Inc., 5th & Pine Sts., Pittsburg, Kans.
- Air Reduction Sales Co., 60 E. 42nd St., New York City 17.
- Air & Refrigeration Corp., 475 Fifth Av., New York City 17.
- Air-Speed Tool Co., 1500 W. Slauson Av., Los Angeles 44.
- Air Stream Filter Corp., 2100 Washington Av., St. Louis 3.
- Airtemp Div., Chrysler Corp., 119 Leo St., Dayton 1, O.
- Airtherm Mfg. Co., 711 S. Spring Av., St. Louis 10.
- Airwasher Corporation, Eaton Rapids, Mich.
- Ajax Building Bracket Co., 1551 Rydal-Mount Rd., Cleveland Heights 18, O.
- Ajax Thermostatic Controls Co., Cleveland.
- Ajax Furnace Fitting Company Div., Cincinnati Sheet Metal & Roofing Co., 216 E. Front St., Cincinnati 2.
- Aladdin Heating Corp., 2222 San Pablo Av., Oakland 12, Calif.
- Albertson & Co., Inc., Sioux City 3, Iowa.
- Akron Steel & Sales, Inc., Akron, Ohio.
- Alco Manufacturing Co., 2619 Milam St., Houston, Tex.
- Alco Valve Co., Kingsland Av., St. Louis 5, Mo.
- Alden Manufacturing Co., W. Walnut St., Painesville, Ohio.
- Aldrich Co., Wyoming, Ill.
- Alfol Insulation Co., Inc., 155 E. 44th St., New York City.
- Allegheny Ludlum Steel Corp., 2332 Oliver Bldg., Pittsburgh 22, Pa.
- Allen Billmyre Div., Lamson Corporation, 431 Fayette Av., Mamaroneck, N. Y.
- Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
- Allen, H. D., 3201 Casitas Av., Los Angeles 26.
- Allen Co., Inc., L. B., 6702 Bryn Mawr Av., Chicago 31.
- Allen Corp., 9752 Erwin, Detroit 13.
- Allen Manufacturing Co., Inc., Nashville 1, Tenn.
- Allen Stoker Co., 235 S. Penn St., Allentown, Pa.
- Allis-Chalmers Manufacturing Company, P. O. Box 512, Milwaukee 1.
- Allis Co., Louis, 427 Stewart St., Milwaukee 7.
- Allmetal Weatherstrip Co., 2241 N. Knox Av., Chicago 39.
- Alpha Metals, Inc., 363 Hudson Av., Brooklyn 1.
- Alphil Spot Welding Co., 1058 Pacific St., Brooklyn.
- Alton Manufacturing Co., 111 Camp St., Dallas 2, Tex.
- Alton Mineral Wool Insulation Co., 1415 S. Compton, St. Louis 4.
- Aluminum Co. of America, 801 Gulf Bldg., Pittsburgh 19.
- Aluminum Goods Mfg. Co., Manitowoc, Wis.
- Amazon Heater Co., 3409 Superior Av., Cleveland.
- American Agile Corporation, 5806 Hough Av., Cleveland 3.
- American Air Filter Co., Inc., 355 Central Av., Louisville 8, Ky.
- American Blower Corp., Detroit 32.
- American Brass Co., 414 Meadow St., Waterbury 88, Conn.
- American Cabinet Hardware Corp., Rockford, Ill.
- American Chain Division, American Chain & Cable Co., Inc., York, Pa.
- American Chemical Paint Co., Brookside Av., Ambler, Pa.
- American Coal Burner Co. 12-20 E. Erie St. Chicago 11.
- American Coils, Inc., 25-27 Lexington St., Newark 5, N. J.
- American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
- American Cooling Tower Co., 2710 McGee St., Kansas City, Mo.
- American Engineering Co., 2446 Aramingo Av., Philadelphia 25.
- American Flange & Manufacturing Co., Inc., 30 Rockefeller Plaza, New York 20.
- American Foundry & Furnace Co., Washington at McClun St., Bloomington, Ill.
- American Furnace Co., 2719-31 Delmar Blvd., St. Louis 3.
- American Furnace & Foundry Co., Box 198, Milan, Mich.
- American Gas Burner, Inc., 418 S. Pennsylvania St., Indianapolis, Ind.
- American Gas Machine Co., 505 Front St., Albert Lea, Minn.
- American Hair & Felt Co., 222 N. Bank Dr., Chicago 54.
- American Hard Rubber Co., 11 Mercer St., New York 13.
- American Heating & Engineering Co., New Albany, Ind.
- American Instrument Co., 8010 Georgia Av., Silver Spring, Md.
- American Insulator Corporation, New Freedom, Pa.
- American-Larson Ventilating Co., 1004 Keystone Bldg., Pittsburgh 22, Pa.
- American Machine Products Co., 401 S. Third Av., Marshalltown, Ia.
- American-Marietta Company, 43 E. Ohio St., Chicago 11.
- American Metal Hose Branch, American Brass Co., 67 Jewelry St., Waterbury 88, Conn.
- American Metal Products Co., 730 Hudgins St., Fort Worth 9, Texas.
- American MonoRail Co., 13112 Athens Av., Cleveland 7.
- American Nickeloid Co., 1505 Second St., Peru, Ill.
- American Pulley Co., 4200 Wissahickon Av., Philadelphia 29.
- American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30.
- American Rolling Mill Co., 703 Curtis St., Middletown, O.
- American Screw Co., 21 Stevens St., Providence, R. I.
- American Solder & Flux Co., 2152 East Norris St., Philadelphia.
- American Steel Band Co., Box 565, Pittsburgh 30.
- American Steel & Wire Co., 614 Superior Av., N. W., Cleveland 13.
- American Stove Co., Lorain Div., 1200 Long Av., Lorain, O.
- American Thermal Industries, 440 Illinois, Detroit 1.

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

American Ventilating Hose Co., 15 Park Row, New York 7, N. Y.
American Warming & Ventilating Co., 1017 Summit St., Toledo 4.
Ames Co., W. R., 150 Hooper St., San Francisco 7.
Ampex Electric Corporation, 1155 Howard Av., P. O. Box "A.P.," San Carlos, Calif.
Ampion Corporation, 4-88 Forty-Seventh Av., Long Island City 1, N. Y.
Anchor Burner Co., P. O. Box 4, 823 W. California, Oklahoma City 1, Okla.
Anchor Stove & Range Co., Div. Stratton & Terstegge Co., Third & Culbertson, New Albany, Ind.
Andersen Corporation, Bayport, Minn.
Andrews Heater Co. 1750 W. Jefferson Blvd., Los Angeles 7.
Andrews Heating Co., 117-199 Main St., S. E., Minneapolis 14.
• Anemostat Corp. of America 10 E. 39th St., New York City 16.
Angier Corp. Framingham, Mass.
Annis, Emmett F., 602 S. Central, Glandale 6, Calif.
Andrews-Schroeder Heating Co., Inc., 120 W. Chevy Chase, Glendale 4, Calif.
Anti-Corrosive Metal Products Co., Inc., P. O. Box 788, Albany, N. Y.
Anti-Friction Bearings Company, 2020 S. Figueroa St., Los Angeles 7.
Antigo Building Supply Co., 817 Fulton St., Antigo, Wis.
Apfel & Co., 928 S. Ninth St., Hamilton, O.
Apollo Metal Works, 66th Pl. & S. Oak Park Av., Clearing Sta., Chicago 38.
Apollo Steel Co., 609-617 Warren Av., Apollo, Pa.
Appleton Supply Co., P. O. Box 319, Appleton, Wis.
Applied Mechanics Co., 167 Oliver St., Boston 10.
April Showers Co., 4126 Eighth St., N. W., Washington 11, D. C.
Aqua-Mist Co., 426 Jefferson St., Topeka, Kan.
Arabol Manufacturing Co., 110 E. 42nd St., New York 17, N. Y.
Arcos Corp., 1515 Locust St., Philadelphia 2.
Arcweld Mfg. Co., Inc., 3469 Third Av. W., Seattle 99, Wash.
Arex Co., 333 N. Michigan Av., Chicago 1.
Arlington Electric Co., 5530 Easton Av., St. Louis 12.
Armstrong-Blum Mfg. Co., 5700 Bloomingdale Rd., Cragin Sta., Chicago.
• Armstrong Co., 241 S. Post St., Detroit 17.
Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., 1649 Olentangy River Rd., Columbus 8, Ohio.
Armstrong Products Corporation, Box 940, Huntington 12, W. Va.
• Arr-O-Line, 3050 Fourth Av., South, Minneapolis 8.
Arrow-Hart & Hegeman Elect. Co., 103 Hawthorne St., Hartford 6, Conn.
Associated Heater Parts Co., 2807 S. La Salle St., Chicago 16.
Atcheson Glass Co., T. J., 920 Main St., Buffalo 2, N. Y.
Atchison Specialty Mfg. Co., 1620 Pacific Av., Atchison, Kan.
Atkins & Co., E. C., 402 S. Illinois St., Indianapolis 9, Ind.
Atlas Heating & Ventilating Co., 557 Fourth St., San Francisco 7.
Atlas Utilities Co., Inc., 17 Exchange St., Providence 3, R. I.
Atlas Valve Co., 282 South St., Newark, N. J.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Lock Box 471, Auburn, Ind.
Audel, Publishers, 49 W. 23rd St., New York 10.
• Auer Register Co., 3608 Payne Av., Cleveland 14.
Au-Temp-Co Corp., 521 Fifth Av., New York City 17.
Autoforce Ventilating System, 244 Washington St., Boston 8.
Autogas Co., 2153 Fullerton Ave., Chicago 47.
Auto-Heat Corp., 311 W. 66th St., New York City.
Automatic Burner Corp., 1823 Carroll Av., Chicago 12, Ill.
Automatic Devices Co., Weather Controls Div., 53 W. Jackson Blvd., Chicago 4.
• Automatic Firing Corporation, 6504 Olive St. Rd., St. Louis 5.
Automatic Gas Equipment Co., 301 Brushton Av., Pittsburgh 21.
• Automatic Humidifier Co., 19th & Main Sts., Cedar Falls, Ia.
• Automatic Products Co., 2450 N. 32nd St., Milwaukee 10, Wis.
Automatic Switch Co., 41 E. 11th St., New York City 3.
Automatic Temperature Control Co., Inc., 44 E. Logan St., Philadelphia 44.
Avery Farm Machinery Co., 2006 S. Washington St., Peoria 2, Ill.

B

• B. G. B. Manufacturing Co., 5021 Wyoming, Dearborn, Mich.
B/W Controller Corp., 2200 E. Maple Av., Birmingham, Mich.
Babbitt Chemical Specialties Co., 630 Fifth Av., New York 20.
Babcock & Wilcox Co., 85 Liberty St., New York City 6.
• Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh 8, Pa.
Bache & Co., Semon, Greenwich & Morton Sts., New York 14.
Badger Mfg. Co., 106 N. Frances St., Madison, Wis.
Baer Brothers, 438 W. 37th St., New York City 18.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Furnace & Cleaner Mfg. Co., 2810 Midwood Av., Toledo 6, Ohio.
Baker Ice Machine Co., Inc., 1509 Evans St., Omaha 1, Nebr.
Baldor Electric Co., 4358 Duncan Av., St. Louis 10, Mo.
Baldwin-Hill Co., 597 Klagg Av., Trenton 2, N. J.
Balloffet Dies & Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Baltimore Aircoil Co., 402 Colvin St., Baltimore 2.
Baltimore Enamel & Novelty Co., P. O. Box 928, Baltimore 3, Md.
Banner Repair Parts Co., 103 E. Indianola Av., Youngstown 7, O.
Barber-Colman Co., River & Loomis Sts., Rockford, Ill.
• Barber Gas Burner Co., 3704 Superior Av., Cleveland 14.
Bard Mfg. Co., Evansport Road, Bryan, O.
Bardes Range & Foundry Co., E. H., 2619 Colerain Av., Cincinnati, O.
Barnard Co., Geo. A., 74 Prescott St., Worcester, Mass.
• Barnes Heating and Ventilating Co., 330 E. Fourth St., Long Beach 2, Calif.
Barnes & Jones, Inc., 128 Brookside Av., Jamaica Plain, Boston 30.
Barnes Manufacturing Co., 6820 Pennsylvania Av., Cleveland 3.
Barnes Metal Products Co., 4425 W. 16th St., Chicago 23.
Barnes Co., Inc., W. O., 1297 Terminal Av., Detroit 14.
Barnhardt Manufacturing Co., P. O. Box 2176, Charlotte 1, N. C.
Barrett Division, Allied Chemical & Die Corp., 40 Rector St., New York City 6.
Barry Furnace Co., 208 N. B St., Hamilton, O.
• Barth Manufacturing Co., Millidale, Conn.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2.
Barton Co., 64 Glenwood Av., Minneapolis 3.
Bastian-Blessing Co., 4201 W. Peterson Av., Chicago 30.
Bastian Manufacturing Co., W. B., 2117 Violet St., Los Angeles 21.
Bastian-Morley Co., Inc., 208 Truesdale Ave., LaPorte, Ind.
Bath Co., Cyril, E. 70th & Machinery Av., Cleveland 8.
• Bayley Blower Co., 1817 S. 66th St., Milwaukee 14.
Bayonne Steel Products Co., Clinton & Jeliff Aves., Newark 8, N. J.
Beacon-Morris Corp., 60 Brainerd Rd., Allston, Boston 34.
Bead Chain Mfg. Co., 105 Mountain Grove St., Bridgeport 5, Conn.
• Bearlee Products Co., 1255 S. Monroe Ave., Green Bay, Wis.
Bear Mfg. Co., Industrial Div., 2030 Fifth Av., Rock Island, Ill.
Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind.
Beck Engineering Combustion Kompany, 2100 Cole St., St. Louis 6.
Beckett Engineering Co., R. W., W. River St., Elyria, O.
Beckett & Co., Thomas, 2118 Griffin St., Dallas 2, Texas.
Beckley Perforating Co., 305 North Av., Garwood, N. J.
Belanger Fan & Blower Co., 2340 W. Lafayette Blvd., Detroit 16.
Belco Exhaust Fan Mfg. Co., 3830-32 Olive St., St. Louis 8.
Belden Machine Co., 1108 Whalley Av., New Haven 15, Conn.
Bell & Gossett Co., 8200 N. Austin Av., Morton Grove, Ill.
Belmont Smelting & Refining Works, Inc., 330 Belmont Av., Brooklyn 7.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.
• Berger Bros. Co., 229-237 Arch St., Philadelphia 6.
Berger Furnace Mfg. Co., 6601 Kelly St., Pittsburgh 6.
Berger Mfg. Div. of Republic Steel Corp., 1038 Belden Av., N. E., Canton 5, O.
Bergman Tool Mfg. Co., 1573-75 Niagara St., Buffalo 13, N. Y.
Bergstrom Mfg. Corp., Neenah, Wis.
Bern's Specialty Mfg. Co., 2278 Elston Av., Chicago 14.
Bernz Co., Otto, 280 Lyell Ave., Rochester 6, N. Y.
Berridge Shear Company, Jefferson & St. Joseph Sts., Sturgis, Mich.
Bertsch & Co., Church St., Cambridge City, Ind.
Best Register Co., 2005 W. Oklahoma Av., Milwaukee 7.
Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.
• Bethlehem Steel Co., Bethlehem, Pa.
Betz Corp. ,460 State St., Hammond, Ind.
• Beverly Shear Co., 3009 W. 110th Pl., Chicago 43.
Bieler & Son, L., 35-42 41st St., Long Island City 1, N. Y.
Bien Air Conditioning Company, Bell, Calif.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Biggs Supply Co., B. C., Lincoln, Nebr.
Binks Mfg. Co., 3114 Carroll Av., Chicago 12.
Bird Archer Co., 4337 N. America St., Philadelphia.
Bird & Son, Inc., East Walpole, Mass.
• Bishop & Babcock Mfg. Co., 4901 Hamilton Av., Cleveland 14.
• Black & Decker Mfg. Co., 782 Pennsylvania Av., Towson 4, Md.
Black Diamond Stoker Co., E. 4th & Plymouth, Sioux City, Ia.
Black Manufacturing Co., 1426 W. Baltimore St., Baltimore 23, Md.
Blake Manufacturing Co., 1600 Mill St., Rock Island, Ill.
Bliss Co., E. W., 450 Amsterdam Ave., Detroit 2.
Blower Application Co., 918 N. 4th St., Milwaukee 3.
Blue Ridge Talc Co., Inc., Henry, Va.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12.
Bogue Electric Co., 37 Kentucky Av., Paterson 3, N. J.
Bohn Aluminum & Brass, Michigan Ave. & Shelby St., Detroit.
Borm Manufacturing Co., 23 North Union St., Elgin, Ill.
Bossert Co., Inc., 1002 Oswego St., Utica 1, N. Y.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47.
Bovee Furnace Works, 180 W. Eighth St., Waterloo, Ia.
Bowlby Air Devices Co., 300 W. Indianapolis, Wichita, Kansas.
Braden Mfg. Co. 431 N. 14th St., Terre Haute, Ind.

• Advertisement in this issue. See Index to Advertisers, pages 355-356.

Brasco Mfg. Co., 152nd & Commercial Av., Harvey, Ill.
• Brauer Supply Co., A. G., 2100 Washington Ave., St. Louis 3.
Breidert, G. C., Co., 634 S. Spring St., Los Angeles 14.
Bremil Mfg. Co., Box 1030, Erie, Pa.
Brenner & Co., Inc., Jacob, 45 Third St., Fond du Lac, Wis.
• Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport 1, Conn.
Bristol Co., P. O. Box 1790, Waterbury 91, Conn.
Brockway Co., Naugatuck, Conn.
Brooks Co., Inc., B. D., 361 Atlantic Ave., Boston 10.
Brophy, Inc., J. D., 17 W. 60th St., New York 23.
Bros Boiler & Mfg. Co., Wm., 1057 Tenth Ave., S. E., Minneapolis 14.
Brown-Appton Co., 681 Fifth Ave., New York City.
Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton 1, O.
Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., 4443 Wayne Ave., Philadelphia 44.
Brown Steel Tank Co., 2901 S. E. Fourth St., Minneapolis 14.
Brownell Co., 404 N. Findlay St., Dayton 1, O.
Browning Mfg. Co., Inc., Central Ave., Main & Chester Sts., Maysville, Ky.
Brumme Mfg. Co., 1220 E. Empire St., Bloomington, Ill.
• Brundage Co., 500 N. Park St., Kalamazoo 11, Mich.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
• Bruno Tools, 9330 Santa Monica Blvd., Beverly Hills, Calif.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
• Bryant Heater Co., 17825 St. Clair Ave., Cleveland 10.
Buckeye Tools Corporation, 29 W. Apple St., Dayton 1, Ohio.
Buckeye Water Heater Co., 6901 Quincy Ave., Cleveland 4.
Budco Inc., 13415 Gratiot Av., Detroit 5.
Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.
Buffalo Turbine Corp., 2165 Bailey Ave., Buffalo 11.
Burdett Mfg. Co., 19 N. Sheldon St., Chicago.
• Burden Company, 1000 N. Orange Dr., Los Angeles 38.
Burgess-Norton Mfg. Co., 773 Peyton St., Geneva, Ill.
Burgess Soldering Furnace Co., 292 E. Long St., Columbus 15, O.
Burke Electric Co., 1201 W. 12th St., Erie, Pa.
Burnham Boiler Corporation, 2 Main St., Irvington-on-the-Hudson, N. Y.
Burnley Battery & Mfg. Co., Clay St., North East, Pa.
Burns Machinery Co., F. W., 1730 W. North Av., Milwaukee 5.
Burt Mfg. Co., 38 E. South St., Akron 11, O.
Bush Mfg. Co., 100 Wellington St., Hartford 6, Conn.
Byers Co., A. M., Clark Bldg., Pittsburgh 22.

C

C-B Tool Co., Wabank Road, Lancaster, Pa.
C. & H. Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9.
Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia 25.
Calesco Corporation, 58 Buffam, Lynn, Mass.
Callahan Can Machine Co., Inc., 80 Richards St., Brooklyn.
Caloroil Burner Corp., 1477 Park St., Hartford 6, Conn.
Campbell, Andrew C., Division of American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn.
Campbell Engineering Co., 918 N. Union St., Appleton, Wis.
Campbell Htg. Co., E. K., 1606 Main St, Kansas City 8, Mo.
Campbell Heating Co., P. O. Box 833, Des Moines 4, Ia.
• Cam-StaT Incorporated, Div. Paul Henry Company, 2037 S. La Cienega Blvd., Los Angeles 34.
Canatsey Electric Mfg. Co., 2718 McGee St., Kansas City 8, Mo.
Canton Steel Ceiling Co., 194 Ninth Av., New York City.
Canton Stoker Corp., 507 Andrews Pl., S. W., Canton 1, O.
Carajon Chemical Company, Inc., 428 W. Main St., Fremont, Mich.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York City 17.
Carboloy Company, Inc., 11177 E. Eight Mile Rd., Detroit 32.
Carey Co., Philip, Lockwood, Cincinnati 15, O.
Cargocaire Engineering Corp., 75 West St., New York, N. Y.
Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 30.
Carolina Aniline & Extract Co., Inc., P. O. 2386, Charlotte, N. C.
Carpenter Heating & Stoker Co., 1929 E. 55th St., Cleveland 3.
Carpenter & Paterson, Inc., 1190 Bennington St., East Boston, Mass.
Carrier Corp., 302 S. Geddes St., Syracuse 1, N. Y.
Carter Paint Co., 310 N. Main St., Liberty, Ind.
Cartier & Sons Co., M. N., 275 Canal St., Providence 3, R. I.
Cary Mfg. Co., Waupaca, Wis.
Catskill Metal Works, Inc., Catskill, N. Y.
Celotex Corp., 120 S. LaSalle St., Chicago 3.
Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis 8.
Central Rubber & Steel Corporation, Findlay, Ohio.
• Central-West Machinery Co., 335 S. Western Av., Chicago 12.
Centri-Spray Co., 14290 Meyers Rd., Detroit 27.
• Century Electric Co., 1806 Pine St., St. Louis 3.
• Century Engineering Corp., 401-431 Third St., S. E., Cedar Rapids, Ia.
Century Fan & Vent. Co., 43 Cedar St., Stamford, Conn.
Ceramic Products Mfg. Co., 139 E. Garfield Av., Milwaukee 12.
Certain-teed Products Corp., 100 E. 42nd St., New York City.
• Certified Furnace Company, Div. Stainless & Steel Products Co., 1000 Berry Av., St. Paul 4, Minn.
Chain Belt Co., 1618 W. Bruce St., Milwaukee 4.
Chalmers Oil Burner Co., 318 First Av., N., Minneapolis.
Chamberlin Company of America, 1254 Labrosse, Detroit 26.
Champion Blower & Forge Co., Harrisburg Av. & Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 211-215 Eaton St., Peoria 3, Ill.
Champion Products Co., 1197 Terrace St., Muskegon, Mich.
• Champion Tool Co., 376 W. 41st Pl., Los Angeles 37.
Chandler Co., 804 1st Av., N. W., Cedar Rapids, Ia.
• Char-Gale Mfg. Co., 3127 Hiawatha Av., Minneapolis 6.
Chase Brass & Copper Co., Incorporated, 236 Grand St., Waterbury 91, Conn.
Cheesman-Elliot Co., Inc., 639 Kent Av., Brooklyn 11.
Chelsea Fan & Blower Co., Inc., 1206 S. Grove St., Irvington 11, N. J.
Chelsea Products, Inc., 1206 S. Grove St., Irvington 11, N. J.
• Cheney Industries, 623 Prospect St., Trenton 5, N. J.
• Cherry Rivet Co., 231 Winston St., Los Angeles 13.
Chester Mfg. Co., 1420 Thomas St., Lisbon, Ohio.
Chicago Automatic Stoker Co., Inc., 14 N. Clinton St., Chicago 6.
Chicago Belting Co., 113 N. Green St., Chicago 7.
Chicago Die Casting Co., 2520 W. Monroe St., Chicago 12.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22.
Chicago Fan & Fin Coil Company, 1937 Walnut St., Chicago 12.
Chicago Filter Co., P. O. Box 807, Joliet, Ill.
Chicago Fire Brick Co., 1467 N. Elston Av., Chicago 22.
Chicago Furnace Supply Co., 1278 Clybourn Av., Chicago 10.
• Chicago Heat-Master Co., 506 S. Wabash, Chicago 5.
Chicago Heights Furnace Supply Co., 102 E. 22nd St., Chicago Heights, Ill.
Chicago Metal Hose Corp., 1315 S. Third Av., Maywood, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32.
Chicago Perforating Co., 2445 W. 24th Pl., Chicago 8.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17.
Chicago Precision Equipment Co., 920 So. Michigan Av., Chicago 5.
Chicago Rawhide Mfg. Co., 1312 Elston Av., Chicago.
Chicago Rivet & Mach. Co., 9600 W. Jackson Blvd., Bellwood, Ill.
Chicago Steel Foundry Co., 3720 S. Kedzie Av., Chicago 32.
• Chicago Steel Furnace Co., 9326 S. Anthony Av., Chicago 17.
Chicago Tramrail Co., 2910 W. Carroll St., Chicago 12.
Chisholm-Moore Hoist Corp., Div. Columbus McKinnon Chain Corp., Fremont Av., Tonawanda, N. Y.
Cinch Manufacturing Corp., 82 Lothrop, Detroit.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati 25.
Cincinnati Stamping Co., 28-34 W. McMicken Av., Cincinnati 10.
Circo Tool Company, 902 W. Vliet St., Milwaukee 5, Wis.
Circulators & Devices Mfg. Corp., 22 Rose St., New York 7.
• Clarage Fan Co., North & Porter Sts., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Millidale, Conn.
Clark Co., Henry N., 56-62 Union St., Boston 8.
Clark Controller Co., 1146 E. 152 St., Cleveland 10.
Clark Jr., Electric Co., Jas., 600 E. Bergman St., Louisville 3, Ky.
Clark Stek-O Corp., 1631 Dewey Av., Rochester 13, N. Y.
Clauss Shear Co., Fremont, O.
Clay Equipment Corp., Cedar Falls, Ia.
• Clayton & Lambert Mfg. Co., Louisville Div., 1707 Dixie Hwy., Louisville 10, Ky.
• Clayton & Lambert Mfg. Co., Middletown Div., Middletown, O.
Clearing Machine Corp., 6499 W. 65th St., Chicago 38.
Clemson Bros., Inc., Middletown, N. Y.
Cleveland Heater Co., 2310 Superior Av., N. E., Cleveland 14.
• Cleveland Humidifier Co., 7802 Wade Park Av., Cleveland 3.
Cleveland Punch & Shear Works Co., E. 40th & St. Clair Av., Cleveland 14.
• Cleveland Steel Products Corp., Toridheet Div., Madison Av. at W. 74th St., Cleveland 2.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., 1109 E. 283rd St., Wickliffe, Ohio.
Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.
Clizbe Bros. Mfg. Co., P. O. Box 31, Plymouth, Ind.
Coal-O-Matic Co., Trucksville, Pa.
Coast Insulating Corporation, 634 S. Western Av., Los Angeles 5.
Coast Pneumatic Tool Co., 6516 Selma Av., Los Angeles 28.
Coast Water Heater Co., 3131 San Fernando Rd., Los Angeles 41.
Cole Hot Blast Mfg. Co., 3817 S. Racine Av., Chicago 9.
• Coleman Co., Inc., St. Francis & Second St., Wichita 1, Kans.
• Cole-Sewell Engineering Company, 2288 University Av., St. Paul 4.
• Columbia Burner Co., 729 Ewing St., Toledo 7, O.
Columbia Steel Co. (Sub. United States Steel Corp.), Russ Bldg., 235 Montgomery St., San Francisco 6.
Columbus Heating & Ventilating Co., 182 N. Yale Av., Columbus 16, Ohio.
Combustion Engineering Co., Inc., 200 Madison Av., New York 16.
Combustion Engineering Co., Inc., 1032 W. Main St., Chattanooga 1, Tenn.
Commercial Filters Corporation, 18 W. Third St., Boston 27.
Commercial Plastics Co., 201 N. Wells St., Chicago 6.
Commercial Shearing & Stamping Co., P. O. Box 719, Youngstown 1, Ohio.

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Commonwealth Brass Corp., 5781-5835 Commonwealth Av., Detroit 8.
Commonwealth Company, 2127 W. Commonwealth Av., Alhambra, Calif.
Commonwealth Products Co., 1303 Real Estate Tr. Bldg., Philadelphia 7.
Compton Shear Co., W. H., 314 Camden St., Newark 3, N. J.
• Conco Engineering Wks., Div. H. D. Conkey & Co., Mendota, Ill.
• Condensation Engineering Corp., 122 S. Michigan Av., Chicago 3.
Conditionaire Unit Co., 2821 Montrose Ave., Chicago 18.
Congress Die Casting Div., Congress Tool & Die Co., 3750 East Outer Drive, Detroit 12.
Conklin Brass & Copper Co., Inc., T. E., 54-60 Lafayette St., New York 13.
Connery Construction Co., 3900 N. 2nd St., Philadelphia 40.
Connor Eng. Corp., W. B., 114 E. 32nd St., New York 16.
Connors Paint Mfg. Co., Wm., 669-683 River St., Troy, N. Y.
Consolidated Industries, Inc., Lafayette, Ind.
Consolidated Steel Corp., Ltd., P. O. Box 1348, Arcade Station, Los Angeles, Calif.
Continental Air Filters, Inc., P. O. Box 1647, Louisville, Ky.
Continental Instrument Co., 1364 E. 47th St., Cleveland.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
• Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Continental Water Heater Co., Ltd., 1801 Pasadena Av., Los Angeles 13.
Controlair Manufacturing Company, 1932 S. Compton St., Los Angeles.
Cooper Co., Clark, Palmyra, N. J.
Cooper & Cooper, Inc., 37 Fenn St., Pittsfield, Mass.
Cooper Oven Themometer Co., Pequabuck, Conn.
Copeland Refrigeration Corp., Sidney, O.
Copperweld Steel Co., Box 1000, Glassport, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Corbin Div., P & F, American Hardware Corp., 67 Park St., New Britain, Conn.
Corbman Bros., Inc., 315 N. 7th St., Philadelphia 6.
Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.
Cork Import Corp., 39 Park Place, Englewood, N. J.
Cork Insulation Co., Inc., 155 E. 44th St., New York City.
Coroaire Heater Corp., 1422 Euclid Av., Cleveland 15.
• Cotta Transmission Co., 2340 Eleventh St., Rockford, Ill.
Cramer Co., Inc., The R. W., Centerbrook, Conn.
Cramer Sheet Metal Co., R. F. D. 2, Canton, Ohio.
• Crandall Mfg. Co., 1512 W. Slauson, Los Angeles 44.
Crane Co., 836 S. Michigan Av., Chicago 5, Ill.
Crary Mfg. Co., 396 N. Second St., Middleport, O.
• Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
Crise Electric Mfg. Co., 2040 E. Main St., Columbus 16, O.
Crocker-Wheeler Electric Mfg. Co., Ampere 1, N. J.
Cronk Company, 2800 Gaston Av., Dallas 1, Texas.
Cross Engineering Co., 160-178 Dundaff St., Carbondale, Pa.
Crown Controls Company, New Bremen, Ohio.
Crown Heater Company, Box 629, Compton, Calif.
Crown Iron Works, 1229 Tyler St., N. E., Minneapolis 13.
Crucible Steel Co. of America, 405 Lexington Av., New York 17.
Curtis Refrigerating Machine, Div. Curtis Mfg. Co., 1946 Kienlen Av., St. Louis 20.
Cutler-Hammer, Inc., N. 12th St. and W. St. Paul Av., Milwaukee 1.
Cuyahoga Spring Company, 10254 Berea Road, Cleveland 2.

D

Dahlquist Mfg. Co., Inc., 628 Somerville Av., Somerville 43, Mass.
• Dahlstrom Machine Works, 5014 N. Kedzie Av., Chicago 25.
Dahlstrom Metallic Door Co., S. E. Cor. E. Second & Buffalo Sts., Jamestown, N. Y.
Dale Gas Burner, 3293 Kenwood, Ferndale, Mich.
Dalco Appliance Co., 1355 Market St., San Francisco 3.
Dallas Engineering Co., Inc., 2000 S. Akard, Dallas, Tex.
Dalzen Tool & Mfg. Co., 12255 E. Eight Mile Rd., Detroit 5.
• Damascus Steel Products Corp., 2215 Kishwaukee St., Rockford, Ill.
Daniels Mfg. Co., Inc., Sam, Daniels Rd., Hardwick, Vt.
Danzer Metal Works Co., Box 201, Hagerstown, Md.
Dary Company, W. M., Long Beach, Calif.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
Davis & Co., Inc., Dean W., Kentland, Ind.
Davis Regulator Co., 2546 S. Washtenaw Av., Chicago 8.
• Davis & Son Machine Works, 8428 Compton Av., Los Angeles 1.
Davison Chemical Corp., Baltimore 3, Md.
Day Co., 810 Third Av., N. E., Minneapolis 13.
Day & Night Manufacturing Co., P. O. Box 150, Monrovia, Calif.
Dayton-Acme Co., 930 York St., Cincinnati, O.
Dayton Rogers Mfg. Co., 2830 13th Av., S., Minneapolis 7.
Dayton Rubber Mfg. Co., 2342 W. Riverview Av., Dayton 1, O.
Dearborn-Monroe Co., Div. Dearborn Stove Co., 3256 Milwaukee Av., Chicago 18.
Dearborn Stove Co., 1700 W. Commerce St., Dallas 8, Tex.
Debevoise Co., 968 Grand St., Brooklyn 6.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Iron & Steel Co., P. O. Box 72, Decatur, Ala.
Deegan Mfg. Co., E. J., 725 E. 135th St., New York City.
Defender Instrument and Regulator Co., 815 Clark Av., St. Louis 2.
Delavan Engineering Co., 414 12th St., Des Moines 9, Ia.
Delco Appliance Div., General Motors Corp., 391 Lyell Ave., Rochester 1, N. Y.
Delco Products Division, General Motors Corp., 329 E. First St., Dayton, O.
D'Elia Oil Burner Co., Inc., 145 Stratford Ave., Bridgeport 3, Conn.
DeLuxe Furnace & Wall Heater Co., 4812 Western Ave., Los Angeles 37.
Demuth & Sons, Charles, 245 Elm Place, Mineola, L. I., N. Y.
Deniston Co., 4856 S. Western Ave., Chicago 9.
Densewood Corporation, Elkhorn, Wis.
Denver Fire Clay Co., 2301 Blake St., Denver 17, Colo.
Deshler Foundry & Machine Wks., 140 S. East Ave., Deshler, O.
• Des Moines Stove Repair Co., 107 S. W. Second Ave., Des Moines 5, Ia.
Despatch Oven Co. 619 Southeast St., Minneapolis 14.
Detroit Air Conditioning Service Co., Inc., 1314 Holden Ave., Detroit 2.
Detroit Air Filter Company, 1228 W. Kinzie St., Chicago 22, Ill.
Detroit Gas Regulator Co., 742 Rivard St., Detroit 7.
Detroit Graphite Co., 550 Twelfth St., Detroit.
Detroit Hoist & Machine Co., Clay Ave. & GTRR, Detroit.
• Detroit Lubricator Co., 5900 Trumbull Ave., Detroit 8.
Detroit Moulding Div., L. A. Young Spring & Wire Corporation, 9210 Russell St., Detroit 11.
Detroit Safety Furnace Pipe Co., 5960 Second Blvd., Detroit.
Detroit Stamping Co., 350 Midland Ave., Detroit 3.
Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit 11.
Detroit Stoker Co., General Motors Bldg., Detroit 2. (Sales & Engineering); Monroe, Mich. (Main Office & Works).
Detroit Universal Products, 8427 Mack, Detroit.
De Vilbiss Co., 300 Phillips Ave., Toledo 1, O.
Devoe & Raynolds Co., Inc., 44th St. & 1st Ave., New York City 17.
Diamond Castings Co., Terra Cotta Rd., Johnsonburg, Pa.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.
Diamond Iron Works, Inc., 1728 Second St., N., Minneapolis 11.
Diamond Manufacturing Co., 243 W. 8th St., Wyoming, Pa.
Diceler Corp., Gasport, N. Y.
Dick Co., Inc., R. & J., 24-48 Sade St., Passaic, N. J.
Dickson Co., 7420 Woodlawn Ave., Chicago 19.
Dickson Weatherproof Nail Co., P. O. Box 590, Evanston, Ill.
Dieckmann Co., Ferdinand, 1180 Harrison St., Cincinnati 22, O.
Diehl Mfg. Company, Finderne Plant, 1117 Finderne Av., Somerville, N. J.
Diener Mfg. Co., Geo. W., 400 N. Monticello Av., Chicago.
Disston & Sons, Inc., Henry, Unruh & Milner Sts., Tacony Sta., Philadelphia 35.
DoALL Co., 254 Laurel Ave., Des Plaines, Ill.
DoALL Company, 1201 Washington Av., South, Minneapolis 4.
Dockson Corp., 3839 Wabash Av., Detroit 8.
Dodge Mfg. Co., 500 S. Union St., Mishawaka, Ind.
Doelger & Kirsten, Inc., 3015 W. Chambers St., Milwaukee 10.
Dollinger Corp., 11 Centre Park, Rochester 3, N. Y.
Domestic Gas Equipment Co., San Francisco 9.
Domestic Thermostat Co., 156 W. Pico Blvd., Los Angeles 15.
Dongan Electric Manufacturing Co., 2981 Franklin St., Detroit 7.
Dornback Furnace & Fdry. Co., 724 E. 103rd St., Cleveland 8.
Dow Chemical Company, Midland, Mich.
• Dowagiac Steel Furnace Co., Beeson St., Dowagiac, Mich.
Downs-Smith Brass & Copper Co., Inc., 304-320 E. 45th St., New York 17.
• Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 7, Mich.
Dravo Corp., Neville Island, Pittsburgh 25.
Drayer-Hanson, Inc., Box 2215, Terminal Annex, Los Angeles 54.
• Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36.
Drico Industrial Corporation, 29 Broadway, New York 6.
Dri-Steam Products, Inc., 29 Broadway, New York 6.
Dry-Zero Corp., 222 W. North Bank Drive, Chicago 54.
Dual-Air Fan Corp., 711 W. Lake St., Chicago.
Dual-Heat Iron Company, 4370 Sunset Blvd., Los Angeles 27.
Dual Remote Control Co., Wayne, Mich.
Dunn-Rite Products, 6333 N. Telegraph Rd., Dearborn, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.
du Pont de Nemours & Co., E. I., Wilmington 98, Del.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Durex Co., 20 N. Wacker Dr., Chicago.
Duriron Co., Inc., 450 N. Findlay St., Dayton 1, O.
Dustless Painting Machine Corp., 272 Main St., New Britain, Conn.
Dust Suppression & Engineering Co., 566 S. Bellevue Av., Lake Orion, Mich.
Dwyer Mfg. Co., F. W., 317 S. Western Av., Chicago 12.
Dynamic Air Engineering, Inc., 1619 S. Alameda St., Los Angeles 21.

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E

Eagle-Picher Co., American Bldg., Central Pkwy. & Walnut, Cincinnati 1.
Earl Co., Warren, 3409 McKinney Av., Houston, Tex.
Eastern Air Devices, Inc., 585 Dean St., Brooklyn 17.
Eastern Oil & Equipment Co., 27 Portland St., Portland 1, Me.
Eastern Stainless Steel Corporation, P. O. Box 1975, Baltimore 3, Md.
Eastern States Supply Co., 127 Troutman St., Brooklyn 6.
Eav-Tex Co., 307 Lincoln Av., Upper Darby, Pa.
Eckhart Manufacturing Company, 470 W. First Av., Roselle, N. J.
Eclipse Fuel Engineering Co., 707 S. Main St., Rockford, Ill.
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Economo Gas Products Co., 8832 Michigan Av., Detroit 10.
Eddy Stoker Corp., 4717 W. North Av., Chicago 39.
Edison, Inc., Thomas A., Instrument Div., Lakeside Av., West Orange, N. J.
Edwards Furnace Co., 25 East Av., Wellsboro, Pa.
Edwards Mfg. Co., Inc., 337 Eggleston Av., Cincinnati 2, O.
● Effecto Grille Co., 9930 Freeland, Detroit 27.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Elermann Floor Scraper Co., 102 E. Market St. (rear), York, Pa.
Eisler Engineering Co., 761 S. 13th St., Newark 3, N. J.
Elco Tool & Screw Corp., 1800 Broadway, Rockford, Ill.
Electric Arc, Inc., 152 Jeliff Av., Newark 8, N. J.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland 4.
Electric Furnace-Man, Inc., 4th & Furnace Sts., Emmaus, Pa.
Electric Machinery Mfg. Co., 1137 Tyler St., N. E., Minneapolis 13.
Electric Soldering Iron Co., Inc., W. Elm St., Deep River, Conn.
Electric Sprayit Co., 1415 Illinois Av., Sheboygan, Wis.
Electrimatic Div., The Simoniz Co., 2100 Indiana Av., Chicago 16.
Electroaire Corp., 41-38 37th St., Long Island City 1, N. Y.
Electro Dynamic Div., Electric Boat Co., Bayonne, N. J.
Electro Lift, Inc., 32 Church St., New York 7.
Electrol Manufacturing Co., 22 Union Av., Rutherford, N. J.
Electroloy Company, Inc., 435 N. Michigan Av., Chicago 11.
Electronic Products Co., St. Charles, Ill.
Electrovent Corp., 5245 Western Av., Detroit 10, Mich.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago 7.
● Elgo Shutter & Mfg. Co., 6970 W. Jefferson Av., Detroit 17.
Ellison Draft Gage Co., 214 W. Kinzie St., Chicago 10.
El Van Ayre Corporation, 628 B of L E Bldg., Cleveland 14.
Emerson Electric Mfg. Co., 8100 Florissant Av., St. Louis 21.
Empire Door Co., Inc., 431 Southern Blvd., New York 55, N. Y.
Empire Metal Co., 820 E. Water St., Syracuse, N. Y.
Empire Stove Company, Belleville, Illinois.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City 1, N. Y.
● Enderle, Inc., Ltd., Frank X., 1715 San Fernando Rd., Los Angeles 41.
Engelhard, Inc., Chas., 900 Passaic Av., East Newark, N. J.
Enterprise Foundry, Inc., 1123 E. "B" St., Belleville, Ill.
Equipment Sales Co., Inc., 306 13th St., Oakland 12, Calif.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 N. Lawrence St., Philadelphia 40.
● Ermac Company, 5531 S. Vermont, Los Angeles 37.
Eselgroth Co., 22 Edison Pl., Newark 2, N. J.
Ess Instrument Co., 96 Washington Av., Bergenfield, N. J.
Essick Mfg. Co., 1950 Santa Fe Av., Los Angeles 21.
Estate Stove Co., Hamilton, O.
Etched Products Co., 3901 Queens Blvd., Long Island City 4.
Euclid Crane & Hoist Co., 1375 Chardon Rd., Euclid 17, Ohio.
Eutectic Welding Alloys Corporation, 40 Worth St., New York City 13.
Evans Products Co., Heating & Appliance Div., Plymouth, Mich.
Even-Air Mfg. & Sales Co., 13931 Hamilton Av., Detroit 3.
Evercrete Corporation, 19 W. 44th St., New York City.
EverHot Heater Company, 5189 Wesson Av., Detroit 10.
Everhot Mfg. Co., 57 S. 19th Av., Maywood, Ill.
Everhot Products Co., 2059 W. Carroll Av., Chicago 12.
Eveready Supply Company, 3207 Gaston Av., Dallas 2, Texas.
● Excel Heating & Air Conditioning Co., 3715 Belmont Av., Chicago 18.
Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago 6.
Excelsior Stove & Mfg. Co., 510 S. Front St., Quincy, Ill.
Excelsior Tool & Machine Co., 31st & Ridge Av., East St. Louis, Ill.
Expert Welding Machine Company, 17144 Mt. Elliott St., Detroit.
Extended Surface, Inc., 58 Second Av., Brooklyn, N. Y.
Extruded Plastics, Inc., New Canaan Av., Norwalk, Conn.

F

F & E Manufacturing Co., Box D, Centerville, Calif.
Fafnir Bearing Co., 37 Booth St., New Britain, Conn.
Fairbanks, Morse & Co., 600 S. Michigan Av., Chicago 5.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmount Tool & Forging Co., 10611 Quincy Av., Cleveland 6.
Falstrom Co., Main Ave. & D. L. & W. R. R., Passaic, N. J.
Famco Machine Company, 1314 Eighteenth St., Racine, Wis.
Famous Furnace Co., 6420 Woodland Av., Cleveland 4.
Farquhar Furnace Co., 150 Owens Av., Wilmington, O.
Farr Co., 2615 Southwest Dr., Los Angeles 43.
Farrell-Cheek Steel Co., Stoker Parts Div., First & Lane Sts., Sandusky, O.
Farrelloy Co., Inc., 1243 N. 26th St., Philadelphia 21.
Farris Furnace Co., 920-930 Enos Av., Springfield, Ill.
Faultless Heater Corp., 10217 St. Clair Av., Cleveland.
FauceHot Heater Co., LaPorte, Ind.
Favorite Stove Co., 440 Webster St., Piqua, O.
Fearless Tool Co., 1234 S. Gramercy Place, Los Angeles 6.
Federal Machine & Welder Co., 212 Dana St., Warren, O.
● Federal Machinery Company, 134 Grand St., New York 13.
Federal Water Heater Co., Inc., Burbank, Calif.
Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.
Fee & Mason Mfg. Co., 81 Beekman St., New York City.
Fee & Stemwedel, Inc., 2210 Wabansia Av., Chicago 47.
Felters Co., Inc., 210 South St., Boston 11.
Fenwal, Incorporated, 200 Pleasant St., Ashland, Mass.
Ferdon Equipment Engineering Co., 26 Evans Place, Hillside, N. J.
● Fern, Ralph, 2517 Boulevard Av., Scranton 9, Pa.
● Field Control Div., H. D. Conkey & Co., Drawer 111, Mendota, Illinois.
Fieser Co., F. J., 54 W. 21st St., New York 10.
Figge Company, 1734 W. Ogden Av., Chicago 12.
Finger, Joe, 7907 Madison Av., Cleveland 2.
Fingles Co., Reisterstown Rd. at Elgin Av., Baltimore 17.
● Finn Engineers, Jerry, N-201 First National Bank Bldg., St. Paul 1, Minn.
Firecraft Corporation, 3319 Wallace St., Chicago 16.
Fire-King Stoker Company, 3760 E. St. Clair St., Indianapolis 1.
● Fireline Stove & Furnace Lining Co., 1816 Kingsbury St., Chicago 14.
Firestone Tire & Rubber Co., Firestone Park, Akron, O.
Firewel Company, 127 Broadway, Buffalo 3, N. Y.
Fisher Governor Co., 203 First Av., Marshalltown, Ia.
● Fitzgibbons Boiler Co., Inc., 101 Park Av., New York City 17.
Flemm Lead Co., Inc., Bradley Av. & School St., Long Island City 1, N. Y.
Flintkote Co., 30 Rockefeller Plaza, New York 20.
Flood Co., 6217 Carnegie Av., Cleveland.
Floral City Co., 402 S. Monroe St., Monroe, Mich.
Florence Stove Co., 205 School St., Gardner, Mass.
Floridin Co., Warren, Pa.
● Fluid Heat Division, Anchor Post Products, Inc., 6720 Eastern Av., Baltimore 24, Md.
Flux-All Chemical Products, 4018 Tenth Av., New York City.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2.
Flynn Mfg. Co., Michael, N. W. Cor. Allegheny Av. & Tulip St., Philadelphia 34.
Follansbee Steel Corp., Third & Liberty Avs., Pittsburgh 30.
Folsom Snow Guard Co., 336 Union St., Millis, Mass.
Foote Foundry Co., J. B., N. Main St., Fredericktown, O.
Ford Blow Pipe & Manufacturing Co., 285 Poplar Av., Memphis 1, Tenn.
Ford Chain Block Div., American Chain & Cable Co., Inc., 2nd and Diamond Sts., Philadelphia 23.
Ford Roofing Products Co., 111 W. Washington St., Chicago 2.
● Forest City Foundries Co., 2500 W. 27th St., Cleveland 13.
Fossum Mfg. Co., M. H., 1795 St. Clair Av., St. Paul.
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.
Fraser Furnace Co., Inc., 445 S. San Joaquin St., Stockton, Calif.
Fraser & Johnston Co., 725 Potrero Av., San Francisco 10.
● Frayn & Co., N. J., P. O. Box 1005, Redwood City, Calif.
Frederick Iron & Steel, Inc., Frederick, Md.
Freed Heater & Stoker Co., 1242 Widener Bldg., Philadelphia 7.
Freed Products Co., 1510 Third Ave., Moline, Ill.
Freeport Burner & Fan Co., Freeport, Ill.
Fresh'nd-Aire Co., 221 N. LaSalle St., Chicago 1.
● Frey & Co., Frank P., 2634 W. Madison St., Chicago.
Frick Co., W. Main St., Waynesboro, Pa.
Friedley-Voshart Co., 763 W. Lexington St., Chicago.
Friendly Furnace & Foundry Co., 2405 E. Fourth St., Sioux City 19, Ia.
Friez Instrument Div., Bendix Aviation Corp., Taylor Av. & Loch Raven Blvd., Towson, Baltimore 4.
Frigidaire Div., General Motors Corp., 300 Taylor St., Dayton 1, O.
● Front Rank Furnace Co., Div. Liberty Foundry Co., 2500 Ohio Av., St. Louis 4.
Fulton Syphon Co., Box 400, Knoxville 4, Tenn.
● Furblo Co., Hermansville, Mich.

G

G. & O. Mfg. Co., 138 Winchester Av, New Haven 8, Conn.
G. M. Manufacturing Co., 50 W. Third St., New York 12.
G. & S. Tool Company, 8790 Grinnell St., Detroit.
● Gallaher Co., Box 7, Owatonna, Minn.
Galvan Manufacturing Co., New Albany, Ind.
Galv-Weld Products, P. O. Box 37, Sta. D, Dayton 10, Ohio.
Gammeter Co., W. F., Lincoln Av. Extension, Cadiz, O.
Gar Wood Industries, Inc., 7924 Riopelle St., Detroit 11.

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Garden City Fan Co., 332 S. Michigan Blvd., Chicago 4.
Garden City Laboratory, Inc., 2744 W. 37th Pl., Chicago.
Gardiner Metal Co., 4820 S. Campbell Av., Chicago 32.
Gas-Con Equipment Co., 2722 Trice Av., Waco, Tex.
Gas & Oil Industry Laboratories, Inc., 4 Paine Av., Irvington 11, N. J.
Gas Equipment Manufacturing Co., 16830 Miles Av., Cleveland 22.
Gates Rubber Co., Sales Div., Inc., 999 S. Broadway, Denver 17 Colorado.
Gaul Air Conditioner Co., 3116 N. Main St., Dayton 5, O.
• Gehl Bros. Mfg. Co., West Bend, Wis.
Gehri Co., 1117 Tacoma Ave., Tacoma 3, Wash.
Geisel Manufacturing, Inc., 61 West Av., Elyria, Ohio.
• Gelert Company, C. R., 35 N. Raymond Av., Pasadena 1, Cal.
General Blower Co., 8600 Ferris Av., Morton Grove, Ill.
General Blower Co., Inc., 6137 Market St., Philadelphia 39.
General Bronze Corporation, 34-19 Tenth St., Long Island City 1, N. Y.
• General Controls Co., 801 Allen Av., Glendale 1, Calif.
General Corporation, 3353 University Av., Minneapolis.
General Electric Co., Appliance & Merchandise Dept., 1285 Boston Av., Bridgeport 2, Conn.
General Electric Co., Air Cond. Dept., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Chemical Dept., 1 Plastics Av., Pittsfield, Mass.
General Electric Co., Apparatus, 1 River Rd., Schenectady 5, N. Y.
General Electric Co., Nela Park, Cleveland 12.
General Engineering & Manufacturing Co., 4417 Oleatha Av., St. Louis 16.
• General Filters, Inc., 12890 Westwood Av., Detroit 23.
General Gas Light Co., 212 N. Park St., Kalamazoo 11F, Mich.
General Machine Co., Inc., Fourth & Furnace Sts., Emmaus, Pa.
General Machinery Co., 3500 Riverside Av., Spokane 1, Wash.
General Oil Heating Corp., 322-6 55th St., West New York, N. J.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Refrigeration Div., Yates-American Machine Co., Shirland Av., Beloit, Wis.
General Scientific Equipment Co., 27th & Huntingdon Sts., Philadelphia 32.
General Sheet Metal Works, Inc., Silliman Av. & Ash St., Bridgeport 5, Conn.
General Water Heater Corp., 7 E. Cypress Av., Box 471, Burbank, Calif.
General Wesco Stove Co., 621 N. Jefferson Av., Springfield, Mo.
• Gerett Corp., M. A., 722 W. Winnebago St., Milwaukee 5.
Gerhardt, W. F., 2007 W. Broad St., Richmond 20, Va.
Gerstein & Cooper Co., 1 W. Third St., South Boston 27, Mass.
Geuder, Paeschke & Frey Co., W. St. Paul Av., and N. 15th St., Milwaukee 3.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
• Gillen Co., J. L., Dowagiac, Mich.
Gillian Mfg. Co., 7750 Dubois St., Detroit 11.
Gilmer Co., L. H., Div. United States Rubber Co., Cottman & Keystone Sts., Tacony, Philadelphia 35.
Gilmore & Co., Jackson G., 167 E. State St., Columbus 15.
Gisholt Machine Co., 1253 E. Washington Av., Madison 3, Wis.
Glasby Mfg. Co., Inc., J. P. Montgomery & Willett Sts., Bloomfield, N. J.
Glaser Lead Co., Inc., 31 Wyckoff Av., Brooklyn 27, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
Glenn-Roberts Company, P. O. Box 12, Fruitvale Sta., Oakland 1, Calif., and 2107 Adams St., Indianapolis 1, Ind.
Glidden Co., 11001 Madison Av., Cleveland 2.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Globe Machinery & Supply Co., E. 1st & Court Av., Des Moines 6, Ia.
Globe Roofing Products Co., Inc., 2207 Schrage Av., Whiting, Ind.
• Goergen-Mackwirth Company, Inc., 817 Sycamore St., Buffalo, 12.
• Goese Mfg. Co., 2548 N. 18th St., Milwaukee 6.
Goethel Sheet Metal Works, Inc., Alfred, 1912 N. Killian Pl., Milwaukee 12.
Goettl Bros., 714 S. Central Av., Phoenix, Ariz.
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh.
Goldens' Foundry & Machine Co., P. O. Box 96, Columbus, Ga.
Goldsmith Metal Lath Co., Chickering & B & O RR, Cincinnati, O.
Goodfriend Plb. & Htg. Burner Sales, 13931 Hamilton, Detroit.
Goodrich Co., B. F., 500 S. Main St., Akron, O.
Goodyear Tire & Rubber Co., Inc., 1144 E. Market St., Akron 16, Ohio.
Governair Corp., 617 N. W. Second St., P. O. Box 1654, Oklahoma City 1, Okla.
Graham Hambly Co., 3625 S. Grand Av., Los Angeles 7, Calif.
Grammes & Sons, Inc., L. F., 388 Union St., Allentown, Pa.
• Grand Rapids Die & Tool Co., Div. Expert Industries, Inc., 1545 Madison Av., S. E., Grand Rapids 7, Mich.
Grand Rapids Wire Products Co., 503 Front Av., N. W., Grand Rapids 4, Mich.
Granite City Steel Co., 20th & Madison Av., Granite City, Ill.
Grant Totten Company, 1215 McKinley Av., S. W. Canton 4, O.
• Grant Wilson, Inc., 141 W. Jackson Blvd., Chicago 4.
Gray, G. L., 509 Grand Ave., New Haven 3, Conn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y.
Grayson Heat Control, Ltd., Lynwood, Calif.
Great Lakes Steel Corporation, Ecorse, Detroit 18.
• Great National Air Conditioning Corp., 2125 N. Harwood St., Dallas 1, Tex.
Green Colonial Furnace Company, 322 S. W. Third St., Des Moines 7, Ia.
Green Fire Brick Co., A. P., Mexico, Mo.
Greenberg's Sons, M., 765 Folsom St., San Francisco 7.
Greene, Tweed & Co., 4377 Bronx Blvd., Bronx 58, N. Y.
Greenlee Tool Co., 2136 Twelfth St., Rockford, Ill.
Gregory Company, J. G., 228 N. LaSalle St., Chicago 1.
Grinnell Co., Inc., 260 W. Exchange, Providence 1, R. I.
Griscom-Russell Co., The, 285 Madison Av., New York 17.
Griswold Mfg. Co., 1001-1065 W. 12th St., Erie, Pa.
Grob Brothers, Grafton, Wis.
Grobet File Corp. of America, 421 Canal St., New York City 13.
Grossenbacher Furnace Co., 9416 W. Milton Av., St. Louis 14.
Guardian Electric Mfg. Co., 1400 Washington Blvd., Chicago 7.

H

H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia 32.
H-P Products, Akron 2, Ohio.
H P L Mfg. Co., 2015 E. 65th St., Cleveland 3.
Hague & Co., Inc., Alfred, 224 34th St., Brooklyn 32, N. Y.
Haines Gauge Company, Inc., 2301 W. Allegheny Av., Philadelphia 32.
Haldeman, Inc., Harry F., 1106 S. Hope St., Los Angeles 15.
• Hall-Neal Furnace Co., 1326 N. Capitol Ave., Indianapolis 7.
Hamblin & Russell Mfg. Co., Inc., Worcester, Mass.
Hammel Radiator Engineering Co., 3348 Motor Av., Los Angeles 34.
Hammett Electric Mfg. Co., 2558 McGee Trafficway, Kansas City 8, Mo.
Hammond Machinery Builders, Inc., 1694 Douglas Av., Kalamazoo 54, Mich.
Hampton Electric Mfg. Co., 1238 Voskamp St., Pittsburgh 12.
Handees Co., Dept. R-161, Bloomington, Ill.
Handelan Washed Air Co., 4006 Washburn Av., South, Minneapolis.
Handley-Brown Heater Co., 2501 Brooklyn Rd., Jackson, Mich.
Handler Boiler & Tank Co., 6025 W. 66th St., Chicago.
Handy & Harman, 82 Fulton St., New York 7.
Hansen Electric Co., 680 Valencia St., San Francisco 10.
Hansen Mfg. Co., Inc., Princeton 6, Ind.
Hare Engineering Co., 155 W. Congress St., Detroit 36.
Harnischfeger Corp., 4400 W. National Av., Milwaukee 14.
Harper Company, H. M., 2620 W. Fletcher St., Chicago 18.
Harrington Co., 1642 W. Callowhill St., Philadelphia 30.
• Harrington & King Perforating Co., 5649 Fillmore St., Chicago 44.
• Harris, A. R., 4546 Hohman Ave., Hammond, Ind.
Harris Calorific Co., 5501 Cass Av., N. W., Cleveland 2.
Harrison Radiator Cover Company, 4718 W. Fifth Av., Chicago 44.
• Hart & Cooley Mfg. Co., 500 E. Eighth St., Holland, Mich.
Hart & Crouse Corporation, 301 Turner St., Utica, N. Y.
Hart Furnace and Supply Co., 238 E. Main St., Louisville 2, Ky.
Hart Mfg. Co., Bartholomew & Hamilton Sts., Hartford, Conn.
Hart-Mun Furnace Co., 2507 E. 15th St., Tulsa 5, Okla.
Hartwell Engineering Co., 3417 Crenshaw Blvd., Los Angeles 16.
Hartzell Propeller Fan Co., Div. Castle Hills Corp., 1025 Roosevelt Av., Piqua, O.
Harvey Machine Co., Inc., 19200 S. Western Av., Torrance, Calif.
Harvey, Inc., Sid, 108 E. Mineola Av., Valley Stream, N. Y.
• Harvey-Whipple, Inc., 55 Emery St., Springfield 1, Mass.
• Hasko Utilities Company, 119 E. 27th St., New York 16.
Haskins Co., R. G., 615 S. California Av., Chicago 12.
Hassall, Inc., John, Clay & Oakland Sts., Brooklyn 22.
Hastings Air Conditioning Company, Inc., Box 474, 108 S. Colorado Av., Hastings, Nebr.
Hauck Manufacturing Co., 124-136 Tenth St., Brooklyn 15.
Hauserman Co., E. F., 6800 Grant Av., Cleveland 5.
Hays Corp., 782 E. Eighth St., Michigan City, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
• Hayward Mfg. Co., C. A., 5307 River Road, Algonac, Mich.
Healy Ruff Co., 765 Hampten Av., St. Paul 4, Minn.
Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.
Heath & Milligan Mfg. Co., Div. of The Glidden Co., 1833 S. Normal Av., Chicago.
Heating Assurance, E. 124 Augusta Av., Spokane, Wash.
Heating Equipment Co., 600 Indiana St., San Francisco 7.
Heatlox Furnaces, Inc., 4320 S. Tacoma Way, Tacoma 9, Wash.
• Heat Oil, Inc., 7020 Fenkell, Detroit.
Heat-Seal Burner Company, 2018 Cuming Av., Omaha 2, Nebr.
Heat-Timer Corporation, 160 Fifth Av., New York 10.
Hegeler Zinc Co., P. O. Box 599, Danville, Ill.
• Heil Co., 3000 W. Montana St., Milwaukee 1.
Hel-Mor Burner Company, 1725 Concord Av., Detroit 7.
Hemp & Company, Inc., Macomb, Ill.
Henderson & Co., Peter, 35 Cortlandt St., New York 7.
Henderson Furnace & Mfg. Co., P. O. Box 212, Sebastopol, Calif.

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Hendley & Whittemore Co., 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry & Wright Mfg. Co., 760 Windsor St., Hartford 1, Conn.
● Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., 6th & Harrison St., Nashville, Tenn.
Herco Oil Burner Corp., 109 W. Chestnut St., Lancaster, Pa.
Hercules Chemical Co., Inc., 332 Canal St., New York 13.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Av., Brooklyn 7.
Herd Utilities, Inc., 303 Canal St., Providence 3, R. I.
● Heremetal Company, 1310 Aldrich Av., N., Minneapolis 11.
Heritage Coal & Stoker Co., 105 E. 63rd St., Chicago 37.
Herrmann & Grace Co., 671 Bergen St., Brooklyn, N. Y.
Herron-Zimmers Molding Co., 3900 E. Outer Drive, Detroit.
Hershey Machine and Foundry Co., Manheim, Pa.
Hess-Snyder Co., Massillon, Ohio.
● Hess Warming & Ventilating Co., 1221-1227 S. Western Av., Chicago 8.
Hetzel Roofing Products Co., 67 Main St., Newark, N. J.
Hexacon Electric Company, 161 W. Clay, Roselle Park, N. J.
Hillwood Manufacturing Co., 21600 St. Clair Av., Cleveland 17.
Hilo Varnish Corp., 42-60 Stewart Av., Brooklyn, N. Y.
Hinde & Dausch Paper Co., P. O. Box 861, Sandusky, O.
Hirschman-Pohle Co., Inc., 9 Lent Av., LeRoy, N. Y.
Hobart Brothers Co., Canal Lock Square, Troy, O.
Hobsite Products Company, Incorporated, 225 Lafayette St., New York 12.
Hodell Chain Co., 3924 Cooper Av., Cleveland 3.
Hoffman Combustion Engr. Co., 710 Marquette Bldg., Detroit.
● Holcomb & Hoke Mfg. Co., 1545 Van Buren St., Indianapolis 7.
Holden Fan Co., 2503 Danforth, Detroit 12.
Hollup Corp., Div. National Cylinder Gas Co., 3357 W. 47th Place, Chicago.
● Holly Manufacturing Company, 875 S. Arroyo Parkway, Pasadena 5, Calif.
Hollywood Water Heater Co., 5426 San Fernando Blvd., Glendale 3, Calif.
Holtzer-Cabot Electric Co., Div. First Industrial Corporation, 125 Amory St., Boston 19.
Home Furnace Co., 6th St., & P. M. R. R., Holland, Mich.
Home Stove Co., 501 Kentucky Av., Indianapolis.
Homer Furnace & Foundry Corporation, Coldwater, Mich.
Hones, Inc., Charles A., 122 S. Grand Av., Baldwin, N. Y.
Hood Co., B. Mifflin, Daisy, Tenn.
Hook & Miller, 637 Butler St., Etna, Pittsburgh 23.
● Hopwood & Associates, Inc., J. W., 7710 Carnegie St., Cleveland 3.
Horn Co., Inc., A. C., 43-36 Tenth St., Long Island City 1, N. Y.
Horst Mehl Mfg. Co., 1109 Austin St., Houston, Texas.
Horsman-Markin Corp., 2161 Penobscot Bldg., Detroit 26.
● Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hot Boy, Inc., 2021 E. 14th St., Cleveland.
Hotentot Co., Inc., 2423 Farnam St., Omaha, 2, Nebr.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4.
Howe Ice Machine Co., 2825 Montrose Av., Chicago 18.
Howell Electric Motors Co., Lock Box 78, Howell, Mich.
Howes-Woods Co., 210 Bridge St., Cambridge 41, Mass.
Howry-Berg Steel & Iron Works, 2949 N. Speer Blvd., Denver 11, Colo.
Hoyt Heater Co., 2146 E. 25th St., Los Angeles 11.
Hub Specialty Co., 122 Orchard St., W. Somerville 44, Mass.
Hubbell Corp., 319 N. Albany Av., Chicago 12.
Huck Manufacturing Company, 2480 Bellevue Av., Detroit 7.
Hunter Fan & Ventilating Co., 400 S. Front St., Memphis, Tenn.
Hupp Corporation, Globe Stamping Div., 1250 W. 76th St., Cleveland 2.
● Hussey & Co., C. G., 2850 Second Av., Pittsburgh 19.
Hutchinson Burner & Mfg. Co., 517 N. Main, Hutchison, Kansas.
Huwer Heating Corp., R. R. 2, Milford, Mich.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8.
Hyman & Sons., Joseph, Tioga, Livingston and Almond St. Philadelphia 34.

I

Ice Air Conditioning Co., Inc., 794 Union St., Brooklyn 15, N. Y.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Industries, Inc., 1084 Park Av., Sycamore, Ill.
Ilg Electric Ventilating Co., 2850 N. Crawford Av., Chicago 41.
● Illinois Bronze Powder Co., Inc., 2023 S. Clark St., Chicago 16.
Illinois Engineering Co., 2035 S. Racine Av., Chicago 8.
Illinois Iron & Bolt Co., 918 S. Michigan Av., Chicago 5.
Illinois Testing Laboratories, Inc., 412 N. LaSalle St., Chicago 10.
Illinois Zinc Co., 2959 W. 47th St., Chicago 32.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7.
Imperial Electric Co., 64 Ira Av., Akron 9, O.
Independence Stove & Furnace Co., Cor. Hayward & Cottage, Independence, Mo.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6.
● Independent Register Co., 3747 E. 93rd St., Cleveland 5.
Industrial Brownhoist Corp., 135 Washington, Bay City, Mich.
Industrial Engineering Corporation, Terre Haute, Ind.
Industrial Mfg. & Engineering Co., 3845 N. Ravenswood Av., Chicago 13.
Industrial Screw Company, 711 W. Lake St., Chicago 6.
Industrial Service Laboratories, 7656 W. Forest Home Av., Milwaukee 14.
Inferno Co., P. O. Box 1138, Shreveport, La.
Ingersoll Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan Av., Chicago.
Inland Steel Co., 38 S. Dearborn St., Chicago 3.
Insto-Gas Corporation, 1977 E. Woodbridge St., Detroit 7.
Insulating Equipment, Inc., 39 S. LaSalle St., Chicago 3.
Insulite Div. Minnesota and Ontario Paper Co., 500 Baker Arcade Bldg., Minneapolis 2.
Inter-Coastal Paint Co., 15th & Southern R. R., East St. Louis, Ill.
International Engineering, Inc., 1145 Bolander, Dayton 1, O.
● International Heater Co., 101 Park Av., Utica 2, N. Y.
● International Metal Products Corp., 528 S. 15th St., Phoenix, Ariz.
International Nickel Co., Inc., 67 Wall St., New York City 5.
International Register Co., 2620 W. Washington Blvd., Chicago 12.
International Sales Co., 2045 Evans Av., San Francisco 24.
International Steel Co., 1556 Edgar St., Evansville, Ind.
International Vermiculite Co., Girard, Ill.
● Interstate Machinery Co., Inc., 1433 W. Pershing Road, Chicago 9.
Interstate Sales Co., 1123 Broadway, New York City 10.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Iowa Paint Mfg. Co., 118-20 Eighth St., Des Moines 9, Ia.
Iron Fireman Mfg. Co., 3121 W. 106th St., Cleveland 11.
Irvington Varnish and Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.
Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

J

Jack & Heintz, Inc., 17600 Broadway, Cleveland.
Jackes-Evans Mfg. Co., 4400 N. Union Blvd., St. Louis 15.
● Jackson & Church Co., 321 N. Hamilton St., Saginaw 65, Mich.
Jackson Co., Byron, P. O. Box 2017, Terminal Annex, Los Angeles 54.
● Jackson Gas Burner Corp., 8781 Quincy Av., Detroit 4.
Jackson Heating Co., 316½ W. Michigan Av., Jackson, Mich.
Jaden Mfg. Co., 1601 W. 2nd St., Hastings, Nebr.
Jae Manufacturing Co., Mt. Clemens, Mich.
Jamar Co., Walker, 367 S. First Av., E., Duluth, Minn.
James Regulator Co., Inc., 382 Peacock St., Pottsville, Pa.
Jamestown Metal Corp., 104 Blackstone Av., Jamestown, N. Y.
Janette Mfg. Co., 556 W. Monroe St., Chicago 6.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Machine Tool Co., Fourth, Cutter & Sweeney Sts., Cincinnati 3.
Jennings, Freeland L., P. O. Box 75, Lima, Ohio.
Jessop Steel Co., Lock Box 489, Washington, Pa.
● Jessup Signal Gauge Co., 1390 W. Minnehaha Pkwy., Minneapolis 9.
Jewel Mfg. Co., 1841 University Av., St. Paul 4, Minn.
Johns-Manville, 22 E. 40th St., New York City 16.
Johnson Co., Lloyd S., 2241 Indiana Av., Chicago 16.
Johnson Co., S. T., 940 Arlington Av., Oakland 8, Calif., and 401 N. Broad St., Philadelphia.
Johnson Fan & Blower Corp., 1319 W. Lake St., Chicago 7.
● Johnson Gas Appliance Co., 520 "E" Av., N. W., Cedar Rapids, Iowa.
Johnson, Inc., William, Brenner & Kent Sts., Newark 3, N. J.
Johnson Ladder & Shoe Co., Eau Claire, Wisconsin.
Johnson Service Co., 507 E. Michigan St., Milwaukee.
Johnston & Chapman Co., 2925 Carroll Ave., Chicago 12.
Johnston Tin Foil & Metal Co., 6100 S. Broadway, St. Louis 11.
Joliet Heating Corp., 1403 Herkimer St., Joliet, Ill.
Jolly Coker, Inc., 1105 N. Holmes Av., Indianapolis, Ind.
Jones & Laughlin Steel Corp., Third Av. & Ross St., Pittsburgh 30.
Jones Foundry & Machine Co., W. A., 4401 W. Roosevelt Rd., Chicago 24.
Jordan & Co., Paul R., 311 E. South St., Indianapolis 4.
Josam Manufacturing Co., 1783 E. 11th St., Cleveland 14.
Joy Manufacturing Co., La-Del Div., S. Broadway & Mill Av., New Philadelphia, Ohio.
Judson Pacific Co., 1200 17th St., San Francisco & Emeryville, Calif.

K

Kais Sunrise Works, 5659 Linwood Ave., Detroit 8.
Kalamazoo Stove & Furnace Company, 453 Rochester Av., Kalamazoo 6, Mich.
Kalamazoo Tank & Silo Co., Machine Tool Div., 508 Harrison St., Kalamazoo 16, Mich.
Kane & Roach, Inc., Niagara & Shownard Sts., Syracuse, N. Y.
Katelman Foundry & Mfg. Co., Third Av. & Eleventh St., Council Bluffs, Iowa.
Kauffman Air Conditioning Corp., 4336 W. Pine Blvd., St. Louis 8.
Kauffman Co., H. J., 13215 Roselawn Ave., Detroit 4.
Kaustine Company, Inc., Perry, N. Y.
Kawneer Co., Niles, Mich.
Keasbey Co., Robert A., 139 W. 19th St., New York City 11.

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Keasbey & Mattison Co., Butler Av., Ambler, Pa.
Keckley Company, O. C., 400 W. Madison St., Chicago 6.
• Kehm Corporation, 135 S. LaSalle St., Chicago 3.
Keith Furnace Co., Dean Av. at E. 26th, Des Moines 17, Ia.
Keller Tool Company, P. O. Box 268, Grand Haven, Mich.
Kelsey Heating Co., Inc., 277 James St., Syracuse, N. Y.
Kelvin-White Co., 90 State St., Boston 9.
Kennard Corporation, 1819 S. Hanley Rd., St. Louis 17.
Kent Co., Inc., 167 Canal St., Rome, N. Y.
Kent & Co., Inc., J. King, 6477 Manchester Av., St. Louis 10.
Kent Engineering Co., 3000 Hyde Park Blvd., Ridgefield, N. J.
Kerentoff, G. L., 2218 Reading Road, Cincinnati 2.
Kernchen Co., 333 N. Michigan Av., Chicago 1.
Kerotest Mfg. Co., 2525 Liberty Av., Pittsburgh 22.
Kester Solder Co., 4201 Wrightwood Av., Chicago 39.
Keystone Asphalt Products Co., 43 E. Ohio St., Chicago 11.
Keystone Flashing Company, 2310 N. 28th St., Philadelphia 32.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Av., Burlington, Vt.
Killam Gas Burner Co., 236 Broadway, Denver 9, Colo.
• Kimberly-Clark Corp., Neenah, Wis.
King Metal Co., 414 N. W. Fourth St., Oklahoma City 3, Okla.
King Co., Box 178, Owatonna, Minn.
Kingston Products Corporation, Tipton Div., Tipton, Ind.
Kirk & Blum Mfg. Co., 2883 Spring Grove Av., Cincinnati 25.
Kisco Company, Inc., 39th and Choteau, St. Louis 10.
Klaine Company, F. A., Front and Central, Cincinnati 2.
Klauer Mfg. Co., 9th & Washington St., Dubuque, Ia.
Klee Co., George B., 3501 Colerain Av., Cincinnati 23, Ohio.
Kleenair Furnace Co., 5329 N. E. Sandy Blvd., Portland, Ore.
Kleen-Heet, Inc., 1823 Carroll Av., Chicago 12.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros. Engineering Works, 1320 N. Kostner Av., Chicago 51.
Knickerbocker Co., 603 Liberty St., Jackson, Mich.
• Knights Co., James, Sandwich, Ill.
Knowles Mushroom Ventilator Co., Upper Mountain Av., Upper Montclair, N. J.
• Knu-Vise Incorporated, 2200 Eighth St., Detroit 16.
Koil-Les Heater Co., Geneva, Ill.
Kol-Master Corp., Oregon, Ill.
Kopperman & Sons, Joseph, 316 New St., Philadelphia 6.
Koppers Co., Inc., Tar Products Div., Koppers Bldg., Pittsburgh 19.
Korfund Co., Inc., 48-15 32nd Pl., Long Island City 1, N. Y.
Kortz Blower Mfg. Co., 117 Michigan St., N. W., Grand Rapids, Mich.
Kraissl Co., Inc., Terhune & Williams Avs., Hackensack, N. J.
Kramer Bros. Foundry Co., 17 Dell St., Dayton 4, O.
Kramer Trenton Co., N. Olden & Breuning Avs., Trenton 5, N. J.
• Krauser-Boyd, Inc., 553 River Road, North Tonawanda, N. Y.
• Kresky Mfg. Co., 307 Third St., Petaluma, Calif.
Kresno-Stamm Co., 730 Sixth Av., New York, N. Y.
• Krueger Sentry Gauge Company, Green Bay, Wis.

L

Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Louis 1.
Laclede Steel Co., 1317 Arcade Bldg., St. Louis 1.
Laco Oil Burner Co., 238 Union St., Griswold, Ia.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
• Lakewood Engineering & Mfg. Co., 1756 W. Lake St., Chicago 12.
Lamb Electric Company, 627 Lake St., Kent, Ohio.
Lamb & Ritchie Co., 250 Albany St., Cambridge 39, Mass.
Landis & Gyr, Inc, 104 Fifth Av., New York 11.
• Langsenkamp Co., F. H., 229 E. South St., Indianapolis 4.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
Larkin Lectro Products Co., 160 W. 146th St., New York 30.
Lastik Products Co., Inc., 1106 Keenan Bldg., Pittsburgh.
• Lau Blower Co., 2005 Home Av., Dayton 7, O.
Lawler Automatic Controls, 453 N. MacQuesten Pkwy., Mt. Vernon, N. Y.
Lawson Manufacturing Co., 300 N. Lexington Av., Pittsburgh 8.
Leas Co., H. Leslie, Monona, Ia.
Lee Co., K. O., P. O. Box 970, Aberdeen, S. D.
Lee Engineering Company, 1102 Union National Bk. Bldg., Youngstown 3, Ohio.
Lee & Son, Thomas, 128-132 W. Second St., Cincinnati 2.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44.
Leeson Air Conditioning Corporation, 14631 Meyers Rd., Detroit 27.
Lehigh Fan & Blower Co., Front & Linden Sts., Allentown, Pa.
Lehigh Foundries, Inc., P. O. Box 1418, Lancaster, Pa.
Lehon Company, 4425 Oakley Av., Chicago 9.
Leland Electric Co., Inc., 1501 Webster St., Dayton 4, O.
Lennox Furnace Co., 200 S. 12th Av., Marshalltown, Iowa; 1705 Olentangy River Rd., Columbus, Ohio; 400 N. Midler Av., Syracuse, N. Y.
• Levow, David, 308 W. 20th St., New York City 11.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Company, Lewin Metals Div., 12th & Chateau Sts., St. Louis 2.
Lewis Laboratories, Inc., Paul, 922 N. 4th St., Milwaukee 3.
L'Hommedieu & Sons Co., Chas. F., 4521 Ogden Av., Chicago.
Libbey-Owens-Ford Glass Co., Box 1765 & 1766, Toledo 3, Ohio.
• Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Lignum-Vitae Products Corp., 96 Boyd Av., Jersey City, N. J.
• Lincoln Electric Co., 12818 Coit Rd., Cleveland 1.
Lincoln Machine Co., 110 Lincoln St., Boston 11.
Linde Air Products Co., 30 E. 42nd St., New York City 17.
Lindsay Corporation, 1740 25th Av., Melrose Park, Ill.
Link-Belt Co., Stoker Div., 2410 W. 18th St., Chicago 8.
Liquidometer Corp., Skillman Av., 36th and 37th Sts., Long Island City 1, N. Y.
Lisbon Hoist and Crane Company, Lisbon, Ohio.
Little Burner Co., Inc., H. C., 2nd & Lincoln, San Rafael, Calif.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2.
Little Giant Vaporizer Co., 5101 Classen Blvd., Oklahoma City 6.
Little Janitor Furnace Clock Co., 621 Broadway, New York City.
Livingston, Inc., Marshall, Mich.
• Lockformer Co., 4615 Arthington St., Chicago 44.
Lockinvar Products Div., Michigan Tank & Furnace Corp., 14247 Tireman, Dearborn, Mich.
Lockjoint Wood Products Co., 1721 Mildred Av., Wichita 7, Kan.
Lonergan Manufacturing Co., 704 Plastic Road, Albion, Mich.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Los Angeles Gas Appliance Co., Inc., 3816 Medford St., Los Angeles 33.
Los Angeles Sheet Metal Manufacturing Co., Inc., 901 E. Ninth St., Los Angeles 21.
Louden Company, Fairfield, Iowa.
Lovekin Water Heater Co., 21-43 Laurel St., Philadelphia 23.
Lowell & Grayson Manufacturing Co., Monrovia, Calif.
Lucas & Company, Inc., John, 322 Race St., Philadelphia.
Ludowici-Celadon Co., 104 S. Michigan Av., Chicago.
Lukens Metal Co., Thos. F., Hedley & Bath Sts., Philadelphia 37.
Lukens Steel Co., 308 S. First Av., Coatsville, Pa.
Lumm Co., A. H., 2512 Albion St., Toledo 6, O.
Lundy, Inc., E. A., 420 Lexington Av., New York 17.
Lyman Co., H. B., Southampton, Mass.
Lynch Manufacturing Corporation, 3600 Summit St., Toledo 1, Ohio.
Lyon Conklin & Co., Inc., Race & McComas St., Baltimore 30.
Lyon Metal Products, Inc., P. O. Box 671, Aurora, Ill.

M

Maas & Waldstein Co., 438 Riverside Av., Newark 4.
McClure Builders' Supply Co., East Palestine, O.
McCollum Hoist & Mfg. Co., 721 Rogers St., Downers Grove, Ill.
McCord Corporation, 2587 E. Grand Blvd., Detroit 11.
McCorkle Co., D. H., Sixth & Bancroft Way, Berkeley 2, Calif.
McDonald Mfg. Co., A. Y., 12th & Pine Sts., Dubuque, Ia.
• McDonnell & Miller, 400 N. Michigan Av., Chicago 11.
McGraw Electric Co., 5201 W. 65th St., Chicago.
McKay Co., York, Pa.
McLeod & Henry Co., Inc., 395A First St., Troy, N. Y.
McPherson Furnace & Supply Co., 1805 N. E. 2nd Av., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13.
• Made-Rite Furnace Pipe & Fittings Co., 10th & Monroe St., Newport, Ky.
MaGirl Foundry & Furnace Works, P. H., 413 E. Oakland Av., Bloomington, Ill.
• Mahl Manufacturing Co., 3081 Slauson Av., Huntington Park, Calif.
• Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.
• Majestic Co., 733 Erie St., Huntington, Ind.
Majestic Flashing Company, Reisterstown Rd. at Elgin Av., Baltimore 17.
Mall Tool Company, 7740 South Chicago Av., Chicago 19.
Malleable Iron Fittings Co., Lock Box 231, Branford, Conn.
Mallory & Company, Incorporated, P. R., Ray F. Storrow Bldg., Indianapolis, Ind.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Manheim Manufacturing and Belting Co., Manheim, Pa.
Manning, Maxwell & Moore, Inc., 11 Elias St., Bridgeport 2, Conn.
Manufacturer's Fin Coil Co., 2505 S. Pulaski Rd., Chicago 23.
Maple City Furnace Co., 605 S. Main St., Monmouth, Ill.
• Maplewood Machinery Co., 2634 Fullerton Ave., Chicago 47.
Marathon Electric Mfg. Corp., Cherry & Randolph Sts., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Marchliff, Inc., 1702 Summit St., Toledo 11, Ohio.
Marine Mfg. Co., 1757 N. Park Av., Chicago 14.
Marley Chemical Co., 6537 Russell St., Detroit.
Marley Co., 3001 Fairfax Rd., Kansas City 15, Kan.
Marlo Coil Company, 6135 Manchester Av., St. Louis 10.
Marquette Mfg. Co., Inc., 401-409 Johnson St., N. E., Minneapolis, Minn.
Marsh Corporation, Jas. P., 2073 Southport Ave., Chicago 14.

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Marsh Heating Equipment Co., Div. Jas. P. Marsh Corp., 2120 Southport, Chicago 14.
Marsh Lumber Co., Inc., 535-611 Tuscarawas Ave., Dover, O.
Marshall Furnace Co., Dobbins & Hanover Sts., Marshall, Mich.
● Marshalltown Mfg. Co., 901 E. Nevada St., Marshalltown, Ia.
Martens & Stormoen, 15 Hathaway St., Boston 10.
Martin Fan & Blower Co., 4634 W. 21st Place, Chicago 50.
Martin, J. O., and C. U., 647 Minna St., San Francisco.
Martin Stamping & Stove Co., Huntsville, Ala.
Martocello & Co., Jos. A., 229 N. 13th St., Philadelphia 7.
Mason Machine Company, 821 E. Mason Av., York, Pa.
Mason-Neilan Regulator Co., 1190 Adams St., Boston 24.
Masonite Corp., 111 W. Washington St., Chicago 2.
Master Electric Co., 126 Davis Av., Dayton 1, O.
Master Products Co., Inc., 7000 S. Wentworth Av., Chicago 21.
Matt Coil-Less Burner Co., 4015 W. Lake St., Chicago 24.
Matthiessen & Hegeler Zinc Co., LaSalle, Ill.
Mauer Engineering, 2525 Colfax St., Evanston, Ill.
● Maurey Mfg. Co., 2915 S. Wabash Av., Chicago 16.
Maxant Button & Supply Co., 117 S. Morgan St., Chicago 7.
● May-Fiebeger Co., S. 21st St., Newark, O.
● Mayflower Air Conditioners, Inc., Duluth Av. & E. Seventh St., St. Paul 6.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
May Oil Burner Div., Gerotor May Corp., Maryland Av. & Oliver St., Baltimore 3, Md.
Maysteel Products, Inc., 135 W. Wells St., Milwaukee 3.
Maze Co., W. H., Peru, Ill.
Meier Electric & Machine Co., 3525 E. Washington St., Indianapolis 7.
Mel-Gauge Co., Crest Av., East Haven, Conn.
Mellish & Murray Co., 1715 Carroll Av., Chicago 12.
● Mercoid Corp., 4201 Belmont Av., Chicago 41.
Meriam Instrument Co., 10920 Madison Av., Cleveland 2.
Merit Water Heater Co., 133 E. Palmer St., Compton, Calif.
Merkle-Korff Gear Co., 217 N. Morgan St., Chicago 7.
Metal & Thermit Corp., 120 Broadway, New York City 5.
Metropolitan Refining Co., 23 50th Av., Long Island City, N. Y.
Metzner Stove Repair Co., 515 Wyandotte, Kansas City 6, Mo.
● Meyer & Bro. Co., F., 1313 S. Adams St., Peoria, Ill.
● Meyer Furnace Co., 1300 S. Washington St., Peoria 2, Ill.
Meyer Mfg. Co., 2536 Fourteenth St., Detroit 16.
Meyers Mfg. Co., Fred L., 1520 Bender, Hamilton, Ohio.
Michell Air Conditioning Co., Inc., 1725 State St., Schenectady, N. Y.
Micro Products Co., 20 N. Wacker Dr., Chicago 6.
● Midco Register Corporation, 1059 Grand Av., St. Paul 5.
Mid-Continent Metal Products Co., 1960 Clybourn Av., Chicago 14.
Midland Paint & Varnish Co., 9115 Reno Av., Cleveland 5.
Mid-States Equipment Co., 2429 S. Michigan Av., Chicago 16.
● Milcor Steel Co., 4117 W. Burnham St., Milwaukee 4.
● Miller & Doing, 65 York St., Brooklyn 1.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller Floor Furnace Co., 741 E. 14th St., Oakland, Calif.
Miller Heat-O-Meter Company, 1434 W. Atkinson Av., Milwaukee 6.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mills Novelty Co., 4110 W. Fullerton Av., Chicago.
● Milton Equipment Co., 402 Race St., Philadelphia 6.
Milwaukee Brush Mfg. Co., 2236 N. 30th St., Milwaukee.
Milwaukee Gas Specialty Company, P. O. Box 461, Milwaukee 1.
● Minneapolis-Honeywell Regulator Co., 2726 Fourth Av. S., Minneapolis 8.
Minnesota Mining & Manufacturing Co., 900 Fauquier Av., St. Paul 6.
Minn-Kota Foundry & Mfg. Co., P. O. Box 822, Fargo, N. D.
Minster Machine Co., 270 W. 5th St., Minster, Ohio.
Misener Mfg. Co., Inc., 326 E. Washington St., Syracuse 2, N. Y.
Mitchell & Co., Inc., W. K., 29th & Ellsworth, Philadelphia 46.
Mitchell Company, Incorporated, John E., 3800 Commerce St., Dallas 1, Tex.
Modern Controls Corporation, 7620 Kercheval Av., Detroit 14.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3.
Modern Materials Co., 1632 W. Lafayette Blvd., Detroit 16.
Modine Mfg. Co., 17th St., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Av., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., P. O. Box 1115, Cincinnati.
Mohawk Metal Products Co., Frankfort, N. Y.
Monad Products Co., 5032 23rd St., Detroit 8.
Monarch Heating Co., 4661 Alger St., Los Angeles 26.
Monarch Mfg. Works, Inc., Salmon & Westmoreland Sts., Philadelphia 34.
Moncrief Furnace Co., P. O. Box 1673, Atlanta 1, Ga.
Moncrief Furnace & Mfg. Co., Inc., 3903 Main St., Dallas 1, Tex.
Monitor Controller Co., 51 S. Gay St., Baltimore 2.
Monogram Combustion Chamber Co., 731 N. 35th St., Philadelphia 4.
Montag Stove & Furnace Works, 2011 N. Columbia Blvd., Portland, Ore.
Montgomery Brothers, 1122 Howard St., San Francisco 3.
Moore Company, 544 Westport Rd., Kansas City 2, Mo.
Moore Equipment Company, 3827 S. 52nd St., Lincoln 6, Nebr.
● Morey, Dan, 816 S. Robertson Blvd., Los Angeles 35.
Morf Industries, 780 Manor Rd., Staten Island 2, N. Y.
● Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10.
● Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7.
Morse, Smith & Morse, Inc., 49 Beacon St., Watertown 72, Mass.
Mortell Co., J. W., Hobbie Av. & Big Four R. R., Kankakee, Ill.
Moser & Son Manufacturing Co., 227 E. Washington St., Bluffton, Ind.
Motex Metal Process Corporation, 4473-4475 W. Jefferson Av., Detroit 9.
Motionair Company, 3321 E. Slauson, Los Angeles 11.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Mt. Hawley Mfg. Co., Mt. Hawley Airport, Peoria 4, Ill.
● Mt. Vernon Furnace & Mfg. Co., P. O. Box 213, Mt. Vernon, Ill.
Mueller Brass Co., 1925 Lapeer Av., Port Huron, Mich.
Mueller Co., 512 W. Cerro Gordo St., Decatur 70, Ill.
● Mueller Furnace Co., L. J., 2005 W. Oklahoma Av., Milwaukee 7.
Multi-Therm Mfg. Co., Inc., 11637 Linwood, Detroit 6.
Muncie Gear Works, Inc., 700 N. Wysor, Muncie, Ind.
Mundet Cork Corp., 65 S. 11th St., Brooklyn 11.
Mundt & Sons, Charles, 53 Fairmont Av., Jersey City 4, N. J.
Munn and Steele, Inc., 130 Lister Av., Newark 5, N. J.
Munton Manufacturing Company, 9400 Belmont Av., Franklin Park, Ill.
Murray Co., 3200 Canton Av., Dallas 1, Tex.
Murray Manufacturing Co., D. J., 1002-24 Third St., Wausau, Wis.
Mustee Heater Co., 3409 Superior Av., Cleveland 14.
Mutual Liquid Gas & Equipment Co., 3600 W. Imperial Highway, Inglewood, Calif.
Myers Electric Co., 209 First Av., Pittsburgh 22, Pa.
Myers Ladder Equipment Co., 3121 Buena Vista, Madison, Wis.

N

● Naco Manufacturing Co., 7631 Roseberry Ave., Huntington Park, Calif.
Nationalaire Corporation, 13313 Averhill St., Detroit 13.
National Airoil Burner Co., Inc., 1284 E. Sedgley Av., Philadelphia 34.
National Burner & Mfg. Co., 19619 Oakland Av., Detroit.
National Carbon Company, Inc., 30 E. 42nd St., New York 17.
National Cylinder Gas Co., 205 W. Wacker Dr., Chicago 6.
National Electric Welding Machines Co., 1846 N. Trumbull St., Bay City, Mich.
National Engineering & Manufacturing Co., 213 W. 19th St., Kansas City 8, Mo.
National Engineering Products, Inc., Commerce & Savings Bldg., Washington, D. C.
National Foundry & Furnace Co., Station "B," Dayton 7, O.
National Gypsum Co., 325 Delaware Av., Buffalo 2.
National Heater Company, 401 Essex Bldg., Minneapolis 2.
National Lead Co., 111 Broadway, New York City 6.
National Lock Co., Inc., 1902 Seventh St., Rockford, Ill.
National Machine Tool Co., 1536 Clark St., Racine, Wis.
National Mfg. Corp., 151 Fillmore Av., Tonawanda, N. Y.
● National Metal Fabricators, 2136 S. Sawyer Av., Chicago 23.
National Pipe Bending Co., 122 River St., New Haven 13, Conn.
National Sheet Metal Co., 1617-1629 Water St., Peru, Ill.
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Stoker Company, Inc., 2820 Locust St., St. Louis 3.
● National Super Service Co., 1944 N. 13th St., Toledo 2, O.
National Thermal Drive Co., Inc., Hwy. 61 and Kohlman Av., St. Paul 9, Minn.
Nebel Manufacturing Co., P. O. Box 3942, Shaker Sq. Station, Cleveland 20.
Neilson Chemical Co., 6564 Benson St., Detroit 7.
Nelson Bros. & Strom Company, 1620 Racine St., Racine, Wis.
Nelson Co., 2604 4th Av., Detroit.
Nelson Corporation, Herman, 1824 Third Av., Moline, Ill.
Nelson Specialty Welding Equipment Corp., Dept. 5, 440 Peralta Av., San Leandro, Calif.
Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia 36.
Nevinger Manufacturing Co., Inc., Greenville, Ill.
New Albany Machine Mfg. Co., E. 10th & Water Sts., New Albany, Ind.
Newcomb Engineering Co., 526 Monroe Av., Grand Rapids 2, Mich.
New Delphos Mfg. Co., 102-124 S. Pierce St., Delphos, O.
New England Carbide Tool Company, 60 Brookline St., Cambridge, Mass.
Newell & Sons, Irwin, Pa.
New Jersey Zinc Co., 160 Front St., New York City 7.
Newman Brothers, Inc., 662-670 W. 4th St., Cincinnati 3.
New Monarch Machine & Stamping Co., 406 S. W. 9th St., Des Moines 8, Ia.
New Plastic Corporation, 1017 N. Sycamore, Hollywood 38, Calif.
Newport Rolling Mill Co., Div. Andrews Steel Co., 9th & Lowell Sts., Newport, Ky.
New York Blower Co., 3155 Shields Av., Chicago 16.
Niagara Blower Co., 6 E. 45th St., New York City 17.
● Niagara Machine & Tool Works, 637-697 Northland Av., Buffalo 11.
Niles Rolling Mill Co., Niles, O.
No-No Specialty Co., Quincy Av. at E. 69th St., Cleveland 4.
● Norge Heat Div., Borg-Warner Corp., 574 E. Woodbridge St., Detroit 26, Mich.
Norgren Co., C. A., 222 Santa Fe Dr., Denver 9, Colo.

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Nork Products Co., 5897 S. Main St., Los Angeles 3.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Norman Products Company, Inc., 1150 Chesapeake Av., Columbus 8, O.
Norristown Magnesia & Asbestos Co., Washington St., Below Ford St., Norristown, Pa.
North American Fibre Products Co., Standard Building, Cleveland 13.
North Bangor Slate Co., Bangor, Pa.
Northern Blower Co., 6409 Barberton Av., Cleveland 2.
Northern Indiana Brass Co., 935 Plum St., Elkhart, Ind.
Northern Steel & Stoker Corp., 3100 Prospect Rd., Peoria, Ill.
Northwest Foundry & Furnace Co., 2345 S. E. Gladstone St., Portland 2, Ore.
Northwest Lead Company, 2700 16th Av., S. W., Seattle 4, Wash.
• Northwestern Stove Repair Co., 662 W. Roosevelt Rd., Chicago 7.
Nortmann-Duffke Co., 2740 S. 32nd St., Milwaukee 7.
Norwood Filtration Co., N. Maple St., Florence, Mass.
Nugent Furnace, Thos., 223 E. 80th St., New York 21.
NuSteel Company, 1714 S. Ashland Av., Chicago 8.
Nu-Way Corp., 2416 Fourth St., Rock Island, Ill.

O

Oakite Products, Inc., 22 Thomas St., New York 6.
Oakland Foundry Co., Florida and A Sts., Belleville, Ill.
Obdyke, Inc., Benjamin P., 447 N. Eighth St., Philadelphia 23.
O'Brien Varnish Co., 101 N. Johnson St., South Bend 21, Ind.
Ohio Electric Mfg. Co., 5910 Maurice Ave., Cleveland 4.
Ohio Paper Co., Miamisburg, Ohio.
Ohio Products Co., 16113 Munn Road, Cleveland 11.
Ohio Wire Products Co., 217 N. Tuscarawas Av., Dover, Ohio.
Ohl & Co., Geo. A., 151-161 Oraton St., Newark, N. J.
Ohmiac Paint & Refining Co., 6550 S. Central Av., Chicago 38.
Oil Devices, 341 E. Ohio St., Chicago 11.
Olmstead & Co., Chas. M., 14926 Mack Av., Detroit 24.
• Olsen Manufacturing Co., The C. A., Elyria, O.
• Omaha Stove Repair Works, 1206 Douglas St., Omaha 2, Nebr.
O'Neil-Irwin Manufacturing Co., 800 Jefferson Av., Lake City, Minn.
Original Metal Forming Machine Co., 952 Twentieth Av., Seattle 11, Wash.
Ormsby-Osterman Company, 3631 Cass Av., St. Louis 13.
Osborn Mfg. Co., 5401 Hamilton Av., Cleveland 14.
Overly Manufacturing Co., Washington Av., Greensburg, Pa.
• Owens-Corning Fiberglas Corp., 1930 Nichols Bldg., Toledo 1, O.

P

Pacific Gas Heating Co., 2948 Twentieth St., San Francisco 10.
Pacific Industrial Mfg. Co., 848 49th Av., Oakland, Calif.
Pacific Lumber Co., 100 Bush St., San Francisco 4.
Pacific Manufacturing Corporation, 5308 Blanche Av., S. E., Cleveland 4.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit 31.
Packard Electric Div., General Motors Corp., Detroit 2.
Packham Crimper Co., Oak St. & N. Y. C. Depot, Mechanicsburg, O.
Packless Metal Products Corp., 31 Winthrop Av., New Rochelle, N. Y.
Page Steel & Wire Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Company, 2951 W. Carroll Av., Chicago 12.
• Palmer Manufacturing Corp., 705 W. Jefferson St., Phoenix, Ariz.
Palmer Thermometers, Inc., 2501 Norwood Av., Norwood, Cincinnati 12.
Pangborn Corp., Pangborn Blvd., Hagerstown, Md.
Paraffine Companies, Inc., 475 Brannan St., San Francisco 19.
• Paragon Electric Co., 1600 Twelfth St., Two Rivers, Wis.
Paragon Oil Burner Corp., 75 Bridgewater St., Brooklyn, N. Y.
Park City Cornice Works, Inc., 729 Union Av., Bridgeport 7, Conn.
Parker Appliance Co., 17325 Euclid Av., Cleveland 12.
• Parker-Kalon Corp., 190-192 Varrick St., New York City 14.
Parker Manufacturing Company, 2200 Colorado Av., Santa Monica 4, Calif.
Parker Rust-Proof Co., 2177 E. Milwaukee Av., Detroit 11.
Patent Novelty Company, Fulton, Ill.
Patrol Valve Co., Locust, Cor. 114th St., Cleveland 14.
• Patten Co., J. V., 200 DeKalb Av., Sycamore, Ill.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Patterson-Sargent Co., St. Clair, Kopp & 38th St., Cleveland 14.
Payne Furnace Co., 336 N. Foothill Rd., Beverly Hills, Calif.
Peacard Co., M. A., 195 Dudley St., Roxbury Sta., Boston 19.
• Peck, Stow & Wilcox Co., Center St., Southington, Conn.
Pecora Paint Co., 4th St. & Erie Av., Philadelphia 40.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40.
Peerless Electric Co., 2000 W. Market St., Warren, O.
• Peerless Foundry Co., 1853 Ludlow Av., Indianapolis 7, Ind.
Peerless Mfg. Corp., 1400 W. Ormsby St., Louisville 10, Ky.
Peerless of America, Inc., 2901 Lawrence Av., Chicago 25.
Peerless Oil Burner Co., Inc., 3519 Bellefontaine Av., Kansas City 3, Mo.
Peerless Pump Div., Food Machinery Corporation, 1250 Camden Av., S. W., Canton 6, O.
Penflex Sales Co., Div. Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42.
Peninsular Stove Co., 2699 Gratiot Av., Detroit.
Penn Boiler & Burner Mfg. Corp., Fruitville Rd., Lancaster, Pa.
• Penn Electric Switch Co., Goshen, Ind.
Penn Supply & Metal Corporation, 1831 N. Fifth St., Philadelphia 22.
Penn Tool Company, 124 E. Cumberland St., Philadelphia 25.
Penn Ventilating Co., 3252 Goodman St., Philadelphia 40.
Pennsylvania Furnace & Iron Co., P. O. Box 269, Warren, Pa.
Pennsylvania Range Boiler Co., 24th St. & Washington Av., Philadelphia 46.
Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7.
Pennsylvania Wire Glass Co., 1612 Market St., Philadelphia 3.
• Perfection Stove Co., 7609 Platt Av., Cleveland 4.
Perfection Water Heater Co., 5426 N. San Fernando Rd., Glendale 3, Calif.
• Perfex Corp., 500 W. Oklahoma Av., Milwaukee 7.
Perkinson & Brown, 412 N. Wolcott Av., Chicago 12.
Pernot & Rich, Inc., 2546 San Fernando Rd., Los Angeles 41.
Perry Graf Co., Maywood, Ill.
Peters-Dalton, Inc., 17900 Ryan Road, Detroit 12.
Peterson Co., B. A., 200 W. Railroad, Dowagiac, Mich.
Peterson "Freezem" Mfg. & Sales Co., 316 Southwest Blvd., Kansas City, Mo.
Petroleum Equipment Mfg. Co., 75 Brewster St., New Haven 6, Conn.
Petroleum Solvents Corporation, 331 Madison Av., New York 17, N. Y.
• Petroleum Heat & Power Co., P. O. Box 1547, Stamford, Conn.
Pfanstiehl Chemical Co., 104 Lakeview Av., Waukegan, Ill.
Pfening Co., Fred D., 1075 W. 5th Av., Columbus 8, O.
Phelps Dodge Copper Products Corp., British American Tube Div., 40 Wall St., New York City 5.
Phelps Mfg. Co., 801 Thomas St., Little Rock, Ark.
Pheoll Manufacturing Co., 5700 Roosevelt Rd., Chicago 50.
Philadelphia Chain Block & Mfg. Co., Inc., Hancock & Norris Sts., Philadelphia.
Philadelphia Gear Works, Inc., Erie Av. and G St., Philadelphia 34.
Philadelphia Thermometer Co., 6th & Cayuga Sts., Philadelphia 40.
Philadelphia Tramrail Co., 3458 N. Weikel St., Philadelphia 34.
Phillips Cooling Tower Co., Inc., 114 Liberty St., New York City 6.
Phillips Drill Co., 4700 Fifth Av., Chicago 44.
Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Pier Equipment Mfg. Co., 1440 Milton St., Benton Harbor, Mich.
Pioneer Gen-E-Motor, 5841 W. Dickens, Chicago.
Pioneer Water Heater Co., 3131 San Fernando Rd., Los Angeles 41.
Pioneer Tool Company, 1109 Wisconsin Av., Racine, Wis.
Piqua Machine & Manufacturing Co., Inc., Piqua, O.
Pittsburgh Corning Corporation, 632 Duquesne Way, Pittsburgh 22.
Pittsburgh Equitable Meter Div., Rockwell Manufacturing Company, 400 N. Lexington Av., Pittsburgh 8.
Pittsburgh Furnace Parts Co., 109 Federal St., Pittsburgh.
Pittsburgh Lectrodryer Corp., P. O. Box 1766, Pittsburgh 30.
Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22.
Pittsburgh Water Heater Company, P. O. Box 4452, Pittsburgh 22.
Pittston Stove Co., P. O. Box 279, Pittston, Pa.
Plant Rubber & Asbestos Works, Inc., 537 Brannan St., San Francisco 7.
Plasteel Products Co., Washington, Pa.
Plastergon Wall Board Co., Philadelphia Av., Buffalo 7.
Plastic Products Co., 6475 Georgia Av., Detroit 11.
Pleasantaire Corp., 730 Tower Bldg., Washington 5, D. C.
Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago 14.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Plymouth Industries, Inc., 1932 Harrison Av., Plymouth, Ind.
Pocahontas Fuel Company, Incorporated, Stoker Div., 340 E. 131st St., Cleveland 8.
Poe, Ralph W., 306 W. Locust St., Canton, Ill.
• Polo Pump Co., Polo, Ill.
Portland Stove Fdry. Co., 57 Kennebec St., Portland 2, Me.
Potomac Mfg. Co., 316 S. 10th St., Philadelphia 7.
• Potts, Son & Co., Inc., W. F., 1224 Cherry St., Philadelphia 7.
Power Engineering Co., 361 E. Ohio, Chicago 11.
Powermatic Ventilator Company, 4019 Prospect Av., Cleveland 3.
Powers Regulator Co., 2720 Greenview Av., Chicago.
Prat-Daniel Corporation, East Port Chester, Conn.
Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30.
Precision Welder & Machine Co., 138 E. McMicken Av., Cincinnati 10.
Preferred Utilities Manufacturing Corp., 1860 Broadway, New York City 23.
• Premier Furnace Co., Lock Box 150, Dowagiac, Mich.
Premier Metal Etching Co., 21-03 44th Av., Long Island City 1, N. Y.

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Premier Stove Co., Belleville, Ill.
Presstite Engineering Co., 3900 Chouteau St., St. Louis 10.
Progressive Welder Company, 3050 E. Outer Drive, Detroit 12.
● Proie & Coogan Heating Co., 6117 Broad St., Pittsburgh 6.
Propellair, Inc., 1345 Lagonda Av., Springfield, O.
● Protected Steel Products, McAdam Av., Washington, Pa.
Protective Coatings, Incorporated, P. O. Box 3985, Strathmoor Station, Detroit 27.
● Pryne & Co., Inc., Box 3307 Terminal Annex, Los Angeles 54.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Av., St. Louis 20.
● Pullen Stove & Furnace Repair Co., Geo. A., 1333 Lawrence St., Denver 2, Colo.
Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago.
Pyramid Metals Co., 5353 W. Armstrong Av., Chicago 30.
Pyrolite Products Co., 1221-31 W. 74th St., Cleveland 2.
Pyro-Jet Division, Riverside Steel Co., Wheeling, W. Va.

Q

Quad Stove Mfg. Co., 78 East First St., Columbus, Ohio.
Quaker Mfg. Co., 223 W. Erie St., Chicago 10.
Quick Furnace & Supply Co., 215 Court Av., Des Moines 9, Ia.
Quiet-Heet Mfg. Corp., 135 N. J. Railroad Av., Newark 5, N. J.
Quigley Company, Inc., 527 Fifth Av., New York 17.
Quincy Stove Manufacturing Co., 807 S. Front St., Quincy, Ill.

R

R-S Products Corp., 4530 Germantown Av., Philadelphia 44.
Racine Tool & Machine Co., Racine, Wis.
Radiation Furnace Corp., 230 Bond St., Benton Harbor, Mich.
Radiator Specialty Co., 1722 Dowd Rd., Charlotte 1, N. C.
Rajah Company, 53 Locust Av., Bloomfield, N. J.
Ralph Supply Co., Inc., Wadsworth, Ohio.
Ramtite Co., Div. S. Obermayer Co., 2563 W. 18th St., Chicago 8.
● Randall Graphite Products Corp., 609 W. Lake St., Chicago 6.
Ransome Co., 4030 Hollis St., Emeryville 8, Calif.
Rattan Mfg. Co., P. O. Box 1745, New Haven 7, Conn.
Rawlplug Co., Inc., The, 271 Church St., New York 13, N. Y.
Ray Oil Burner Co., 401-499 Bernal Ave., San Francisco 12.
Raytheon Mfg. Co., 100 Foundry St., Waltham 54, Mass.
Ray-Glo, Inc., 818 Webster St., Shelbyville, Ind.
Reading Chain & Block Corporation, 2100 Adams St., Reading, Pa.
Redmond Co., A. G., Owosso, Mich.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Reed Unit-Fans, Inc., 1001 St. Charles Av., New Orleans 8.
Reeves Steel & Mfg. Co., Dover, O.
Refinite Corp., Refinite Bldg., Omaha 8.
Refractory & Insulation Corp., 120 Wall St., New York City 5.
Refrigeration Appliances, Inc., 923 W. Lake St., Chicago 7.
Refrigeration Economics Co., Inc., 1231 Tuscarawas St., E., Canton 2, Ohio.
Rega Mfg. Co., 79 Mt. Hope Av., Rochester 7, N. Y.
Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11.
Rehm, R., 112 208th St., St. Albans, L. I., N. Y.
Reichert Float & Mfg. Co., 2238 Smead Av., Toledo 6, O.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4.
● Reiner & Campbell Co., Inc., 667 Norwood Terrace, Elizabeth 2, N. J.
● Reinhard Brothers Co., 11 S. Ninth St., Minneapolis 2.
Reliable Gas Products Co., 221 Third St., N. E., Cedar Rapids, Ia.
Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd. N. E., Cleveland 10.
Reliance Regulator Corporation, 1000 Meridian Av., Alhambra, Calif.
Remington Air Conditioning Div., Remington Corporation, Cortland, N. Y.
Rempe Co., 340 N. Sacramento Av., Chicago.
Republic Heater Corporation, 2231 Randolph St., Huntington Park, Calif.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown 1, O.
● Republic Steel Corp., Republic Bldg., Cleveland 1.
● Research Products Corporation, 1015 E. Washington Av., Madison 3, Wis.
Resistoflex Corporation, 39 Plansoen St., Belleville 9, N. J.
Retinning Manufacturing Co., 3021 Greenview Av., Chicago.
● Revere Copper and Brass Incorporated, 230 Park Av., New York City 17.
● Rex-Roto Corporation, 14414 Dexter Blvd., Detroit 6.
Rex Welder and Engineering Company, 7 E. 19th St., Kansas City 8, Mo.
Reynolds Electric Company, 2685 W. Congress St., Chicago 12.
Reynolds Gas Regulator Co., 1416 Lincoln St., Anderson, Ind.
Reynolds Manufacturing Co., Springfield, Mo.
Reynolds Metals Company, P. O. Box 2158, Louisville 1, Ky.
Reynolds Metals Co., Reynolds Metals Bldg., Richmond 19, Va.
Reznor Mfg. Co., Lock Box 231, Mercer, Pa.
● Rheem Manufacturing Co., Stokermatic Div., 570 Lexington Av., New York 22, N. Y.
Rhodes, Inc., M. H., 30 Bartholomew Av., Hartford 6, Conn.
Richards, J. Merrill, 25 Huntington Av., Boston 16.
Richards-Wilcox Mfg. Co., Third St., Aurora, Ill.
Richmond Radiator Co., 19 E. 47th St., New York 17.
Riester & Thesmacher Co., 1526 W. 25th St., Cleveland 13.
Riggin Metal Products, Box 267, Kankakee, Ill.
Rigid-Tex Corporation, 658 Ohio St., Buffalo 3.
Rival Strap Corporation, 308 W. 20th St., New York City 11.
● Riverside Machinery Company, Shakopee, Minn.
Riverton Lime & Stone Co., Inc., Riverton, Va.
Robbins & Myers, Inc., 1345 Lagonda Av., Springfield, O.
Roberts-Gordon Appliance Corp., 137 Arthur St., Buffalo 7.
Robertson, F. L., 56 Rano St., Buffalo.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22.
Robinson Aviation, Inc., Teterboro, N. J.
Robinson Insulation Co., P. O. Box 1419, Great Falls, Mont.
Rockford Screw Products Co., 2501 Ninth St., Rockford, Ill.
● Rock Island Register Co., 2425 Fifth Av., Rock Island, Ill.
Rockwood Mfg. Co., 1801 English Av., Indianapolis.
Roebling's Sons Co., John A., 640 S. Broad St., Trenton 2, N. J.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg Sta., Pittsburgh 15.
Rogers Diesel & Aircraft Corporation, 1128 Leggett Av., New York 59.
Rolyan Corp., 2241 Indiana Av., Chicago 36.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Roper Corporation, Geo. D., Blackhawk Park Av., Rockford, Ill.
Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
Rosedale Foundry & Machine Co., Columbus & Preble Avs., N. S., Pittsburgh 12.
Rose Manufacturing Co., 1731 Arapahoe St., Denver 2, Colo.
Ross Sprinkler Co., 34 Roberts St., Pasadena 3, Calif.
● Rotex Punch Company, 4726 E. 12th St., Oakland 1, Calif.
Roto-Beam Division, Peerless of America, Inc., 333 N. Michigan Av., Chicago.
Rotor Corporation, P. O. Box 42, Far Hills Br., Dayton 9, O.
Rotor Tool Company, 17325 Euclid Av., Cleveland 12.
● Round Oak Co., Dowagiac, Mich.
Roxalin Flexible Finishes, Inc., 800 Magnolia Av., Elizabeth, N. J.
Royal-Apex Mfg. Corp., 1389 Atlantic Av., Brooklyn 16, N. Y.
● Royal Heaters, Inc., 1024 Westminster Av., Alhambra, Calif.
Royal Ventilator Co., 415 Locust St., Philadelphia 6.
Royersford Foundry & Machine Co., 55 Main St., Royersford, Pa.
Ruberoid Co., 500 Fifth Av., New York 18.
● Ruby Chemical Co., 74 McDowell St., Columbus 8, O.
● Rudy Furnace Co., Dowagiac, Mich.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12.
Ruggles-Klingemann Mfg. Co., 4 Foster Ct., Salem, Mass.
Ruppright, Siegfried, 299 S. Atlantic Blvd., Los Angeles 22.
Russell Co., F. C., 6400 Herman Av., Cleveland 2.
Russell Mfg. Co., John M., Box 246, Naugatuck, Conn.
Rutland Fire Clay Co., 91 Curtis Av., Rutland, Vt.
Ruud Manufacturing Company, 2934 Smallman St., Pittsburgh 1.
● Rybolt Heater Co., 615 Miller St., Ashland, O.
● Ryerson & Son, Inc., Joseph T., 2558 W. 16th St., Chicago 80.

S

S K F Industries, Inc., Front St. and Erie Av., Philadelphia 32.
St. Charles Mfg. Co., St. Charles, Ill.
St. Clair Foundry Corp., Beech & Wilson Sts., Centralia, Ill.
St. Louis Furnace Mfg. Co., 2710 N. 25th St., St. Louis 6.
St. Louis Tool Co., 6100 Prescott St., St. Louis 15.
St. Paul Corrugating Co., South Wabasha & Water Sts., St. Paul 1, Minn.
● Sall Mountain Co., 176 W. Adams St., Chicago 3.
● Sampsel Time Control, Inc., 600 N. Strong Av., Spring Valley, Ill.
Samuel Stamping & Enameling Co., Manufacturers Rd., Chattanooga, Tenn.
San Angelo Foundry & Machine Co., Drawer 1587, San Angelo, Tex.
Sandberg Co., H. J., 500 N. E. Union Av., Portland 14, Ore.
Sanders, J. A., Successor to Van Praag Sales, Box 123, Fulton, N. Y.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Sanit-Air Products Company, 802 Tower Bldg., South Bend 3, Ind.
Sanvin Chemical Products Co., 1617 21st Av., Moline, Ill.
Sarco Co., Inc., 475 Fifth Av., New York 17.
Sarcotherm Controls, Inc., 280 Madison Av., New York 16.
Sauereisen Cements Co., Sharpsburg Station, Pittsburgh 15.
Savage Co., W. J., 912 W. Clinch Av., Knoxville 2, Tenn.
● Schaefer Brush Mfg. Co., 1025 S. Second St., Milwaukee 4.
● Scheck, William, 353 Shaler Blvd., Ridgefield, N. J.
Schecter Brothers Co., N. W. Cor. Hancock & Huntington Sts., Philadelphia 33.
Scherr Co., Inc., George, 200 Lafayette St., New York 12.
● Schild Manufacturing Company, 739 N. Broadway, Milwaukee 2.
Schill Mfg. Co., 302 Mansfield St., Crestline, O.
Schmieg Industries, Inc., 312-320 Piquette Av., Detroit 2.
Schneible Co., Claude B., 2827 25th St., Detroit 32.
Schoedinger, F. O., 322-358 Mt. Vernon Av. Columbus 16, O.
Schori Process Div. of Ferro-Co. Corp., 8 Forty-third Rd., Long Island City 1, N. Y.

● Advertisement in this issue. See Index to Advertisers, pages 355-356.

• Schwab Furnace Company, 193 S. Second St., Milwaukee 4.
• Schwab Safe Co., East Maine and Blvd., Lafayette, Ind.
• Schwitzer-Cummins Co., 1125 Massachusetts Av., Indianapolis 7.
Sciaky Bros., Inc., 4915 W. 67th St., Chicago 38.
Scientiae Tool Company, 101 Pine St., Dayton, Ohio.
Scottdale Ozone Company, Crescent St., Scottdale, Pa.
Scott-Newcomb, Inc., 2106 Olive St., St. Louis 3.
Scovill Mfg. Co., 99 Mill St., Waterbury, Conn.
Scoville Mfg. Co., Morency-Van Buren Div., Prairie Av., Sturgis, Mich.
Scully Signal Company, 88 First St., Cambridge 41, Mass.
Seamlex Co., 41-23 24th St., Long Island City 1, N. Y.
Seco-Lite Manufacturing Co., 4916 Easton Av., St. Louis 13.
Security Manufacturing Co., 1630 Oakland Av., Kansas City 3, Mo.
Security Valve Company, 410 San Fernando Rd., Los Angeles.
Sequoia Manufacturing Co., 1000 Brittan Av., San Carlos, Calif.
Servel, Inc., Electric Refrigeration Div., 119 Morton Av., Evansville 20, Ind.
Shafer Bearing Corp., 1412 W. Washington Blvd., Chicago 7.
Shakeproof, Inc., 2501 N. Keeler Av., Chicago 39.
Shamblen Furnace Parts Co., 217 First Av., Pittsburgh 22.
Sharon Steel Corp., Drawer 537, Sharon, Pa.
Shaw Burner Company, Inc., 1200 S. Summit, Arkansas City, Kans.
Shedlov Oil Burners, Inc., 723 Third Av., S. Minneapolis 2.
Sheet Metal Mfg. Co., Inc., 953 Myrtle Av., Brooklyn 6.
Sheet Metal Products Co., 320 S. Commercial St., Peoria 2, Ill.
Sheet Metal Specialty Company, 3rd & Liberty Av., Pittsburgh.
Sheldon Slate Products Co., Inc., 5 N. Main St., Granville, N. Y.
Shell Oil Co., 50 W. 50th St., New York City 20.
Shellmar Products Co., 1132 S. Fair Oaks Av., South Pasadena, Calif.
Shepard Niles Crane & Hoist Corporation, 410 Schuyler Av., Montour Falls, N. Y.
Sherman & Co., 197 Canal St., New York 13.
Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1.
Shreveport Engineering Co., Inc., 1553-55 Texas Av., Shreveport, La.
Sight Feed Generator Co., 14 N. Tenth St., Richmond, Ind.
Signal Electric Mfg. Co., P. O. Box 75, Menominee, Mich.
Silent Glow Oil Burner Corp., 1477 Park St., Hartford, Conn.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11.
• Silver Flame, Inc., 7022 Fenkell, Detroit 21.
Simonds Saw & Steel Co., 500 Safety Fund Bk. Bldg., Fitchburg, Mass.
Simplex Manufacturing Co., 200 North Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 11 Park Place, New York 7, N. Y.
Sinker-Davis Co., 230 S. Missouri St., Indianapolis 4.
Sioux City Foundry and Boiler Co., East 8th & Division Sts., Sioux City 2, Ia.
Sioux Steel Co., Sioux Falls, S. D.
Sipe & Company, James B., Box 8010, S. Hills Branch, Pittsburgh.
Sisalkraft Co., The, 205 W. Wacker Dr., Chicago 6.
Skilbeck Mfg .Co., 7432 27th Av., Kenosha, Wis.
Skilsaw, Inc., 5033 Elston Av., Chicago 30.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., 1954 N. 9th St., St. Louis 6.
• Skuttle Manufacturing Co., 517 E. Larned St., Detroit 26.
Sleeth & Son, J. E., 910 N. Howard St., Spokane 11, Wash.
Sly Mfg. Co., W. W., 4736 Train Av., Cleveland 2.
Small Motors, Inc., 2068 Elston Av., Chicago 14.
Smidth & Co., F. L., 60 E. 42nd St., New York 17.
Smith Corporation, A. O., Milwaukee 1.
Smith Furnace Co., 216 S. Croton Ave., New Castle, Pa.
Smith Heater Co., Peter, 10501 Haggerty, Dearborn, Mich.
Smith Company, J. B., 3327 B St., Philadelphia 34.
Smith Manufacturing Co., Inc., F. A., P. O. Box 509, Rochester 2, N. Y.
• Smith, R. E., 1513 Monroe St., Waukegan, Ill.
Smith Welding Equipment Corp., 2633 Fourth St., S. E., Minneapolis 14.
Smooth-on Mfg. Co., 568-574 Communipaw Av., Jersey City 4, N. J.
Snap-On Mfg. Co., 1028 Blue Island Av., Chicago.
Snap-On Tools Corporation, Kenosha, Wis.
Socony Paint Products, Div. of Socony-Vacuum Oil Co., Inc., 26 Broadway, New York City 4.
Solvay Sales Corp., 40 Rector St., New York 6.
Somers, Inc., H. J., 6063 Wabash Av., Detroit 8.
Sonneborn Sons, Inc., L., 88 Lexington Ave., New York 16.
Sonner Burner Co., P. O. Box 903, Winfield, Kan.
Soss Manufacturing Co., 21777 Hoover Rd., Detroit 13.
Sound Equipment Corporation of California, 3903 San Fernando Rd., Glendale 4, Calif.
South Bend Air Products, Inc., 322 E. Colfax, South Bend 22, Ind.
Southbridge Roofing Co., Inc., Hartwell & Chapin Sts., Southbridge, Mass.
Souther Iron Co., E. E., 1952 Kienlen Av., St. Louis 20.
Southern Aircraft Co., Garland, Dallas Co., Tex.
Southern States Iron Roofing Co., Stiles Av. & Louisville Rd., Savannah, Ga.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwest Manufacturing Co., 1615 E. First St., Santa Ana, Calif.
Spartan Aircraft Co., 1900 N. Sheridan Rd., Tulsa, Okla.
Spear Stove & Heater Co., James, 1000 Diamond St., Philadelphia 22.
Speedway Mfg. Co., 1854 S. 52nd Ave., Cicero 50, Ill.
Spencer Thermostat Co., Unit of Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
Spencer Turbine Co., 484 New Park Av., Hartford 6, Conn.
Sperry & Co., D. R., Batavia, Ill.
Sponge Rubber Products Co., Shelton, Conn.
Sporlan Valve Co., 3723 Commonwealth Av., St. Louis 17.
Spray Engineering Co., 103 Central St., Somerville 45, Mass.
Spraying Systems Co., 4021F W. Lake St., Chicago 24.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago.
Spun Steel Corporation, 1201 Camden Av., S. W., Canton 6, O.
Square D Co., 6060 Rivard St., Detroit 11.
Stainless & Steel Products Co., Certified Furnace Co. Div., 1000 Berry Av., St. Paul 4.
Standard Asbestos Mfg. Co., 820-22 W. Lake St., Chicago 7.
Standard Electric Div., Standard Dayton Corporation, P. O. Box 1001, Dayton 1, Ohio.
Standard Fuel Engineering Co., 667 Post Av., South, Detroit 17.
Standard Furnace & Supply Co., 413-17 S. Tenth St., Omaha 8.
Standard Heater & Oil Equipment Co., 245 Cornelison Av., Jersey City 2, N. J.
Standard Heating Equipment Co., 516 Saxon St., Waterloo, Ia.
Standard Heating & Radiator Co., 532 First Av. & Ross St., Pittsburgh 19.
Standard Lime & Stone Co., 2004 First National Bank Bldg., Baltimore 3.
Standard Motor Corporation, Elyria, Ohio.
Standard Pressed Steel Co., Jenkintown, Pa.
• Standard Remote Control Valve Co., 205 Pasadena Av., South Pasadena, Calif.
Standard Rolling Mills, Inc., 143 Jewel St., Brooklyn 22.
Standard Stamping & Perforating Co., 3137 W. 49th Pl., Chicago.
Standard Steel Spring Co., 2640 E. Fifth Av., Gary, Ind.
Standard Ventilator Co., Lewisburg, Pa.
Stanley Electric Tool Div., The Stanley Works, 131 Elm St., New Britain, Conn.
Stanley Tools, New Britain, Conn.
Star Electric Motor Co., 197 Bloomfield Av., Bloomfield, N. J.
Star Expansion Bolt Co., 147 Cedar St., New York City 6.
State Steel Products, Inc., 2500 E. 23rd St., Los Angeles 11.
• State Supply Co., 1336 N. W. Northrup, Portland 9, Ore.
Sta-Warm Electric Co., Ravenna, Ohio.
Steel Products Engineering Co., 1205 W. Columbia St., Springfield, O.
Steel & Tubes, Inc., Div. Republic Steel Corp., 200 E. 131st St., Cleveland 8.
Steffens-Amberg Co., 262 Morris Av., Newark 3, N. J.
Steinhorst & Sons, Inc., Emil, 612 South St., Utica 3, N. Y.
Stephens-Adamson Mfg. Co., 55 Ridgeway Av., Aurora, Ill.
Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22.
Sterling Foundry Co., Sterling, Ill.
Stewart Manufacturing Co., 3209 E. Washington St., Indianapolis 1, Ind.
• Stewart Manufacturing Co., Inc., 610 Bloomfield Av., Bloomfield, N. J.
Stewart Company, W. H., P. O. Box 4, Oklahoma City 1, Okla.
Stewart-Rogers, Inc., 53rd & Whitby Av., Philadelphia 43.
Stoker Drive Company, P. O. Box 400, Frederick, Md.
Stoker-Lad Co., Division at I, Tacoma 3, Wash.
Stokerunit Corp., 4548 W. Mitchell St., Milwaukee 14.

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Stokol Stoker Co., Inc., 21st & Northwestern, Indianapolis 7, Ind.
Stonewall Company, 54th & LaSalle St., Chicago.
Stortz & Son, Inc., John, 210 Vine St., Philadelphia 6.
Stossel & Sons Co., Carl, Front Royal, Va.
Stow Manufacturing Co., 445 State St., Binghamton, N. Y.
Strandwitz & Co., Inc., W. J., Jefferson and Master St., Camden, N. J.
Stratton & Terstegge Co., 1501 W. Main St., Louisville 1.
Streine Tool & Mfg. Co., New Bremen, Ohio.
Structural Slate Co., Robinson Av., Pen Argyl, Pa.
Struthers-Dunn, Inc., 1321 Arch St., Philadelphia 7, Pa.
Sturtevant Co., B. F., Div. Westinghouse Electric, Damon St., Hyde Park, Boston 36.
Sunbeau Heater Company, 3510 S. Hill St., Los Angeles 7.
Sundstrand Engineering Co., 1327 Seventh St., Rockford, Ill.
Sundstrand Pump Division, 2530 Eleventh St., Rockford, Ill.
Sun-Fire Stoker Corporation, 802 E. Eighth St., New Albany, Ind.
Sunshine Mantle Co., Chanute, Kansas.
SuperbO Mfg. Co., 1640 N. Indiana St., Los Angeles 33.
Super Radiator Corp., 652 Stinson Blvd., Minneapolis 13.
Superior Flux Co., 913 Public Square Bldg., Cleveland 13.
Superior Manufacturing Co., Public Sq. Bldg., Cleveland 13.
Superior Manufacturing Co., Alexandria, Ind.
● Superior Products Co., 606 S. 14th St., Omaha 2, Nebr.
Superior Sheet Steel Co., The, Division of Continental Steel Corp., Canton & Louisville Rd., Canton 1, O.
Superior Safety Furnace Pipe Co., 5820 Forsythe Av., Detroit 2.
Superior Steel Corp., Grant Bldg., Pittsburgh.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Supreme Gas Burner Mfg. Co., 9019 VanDyke Av., Detroit 13.
Surface Combustion Corporation, 2375 Dorr St., Toledo 1, O.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6.
Swallow Airplane Co., 917 E. Lincoln, Wichita 1, Kansas.
● Swartwout Co., 18615 Euclid Av., Cleveland 12.
Swift Electric Welder Co., 6560 Epworth Blvd., Detroit 10.
Swift Mfg. Company, 247 McDougall Av., Detroit 7.
● Syncromatic Corporation, 1141 Tenth St., Watertown, Wis.
Syntron Co., Homer City, Pa.

T

Tagliabue Div., C. J., Portable Products Corp., Park & Nostrand Avs., Brooklyn 5.
Talmadge & Co., Webster, 364 Glenwood Av., East Orange, N. J.
Tamms Silica Co., 228 N. LaSalle St., Chicago 1.
Tannewitz Works, 315 Front Av., N. W., Grand Rapids 4, Mich.
Taylor Appliance & Mfg. Co., 339 W. Parent, Royal Oak, Mich.
Taylor-Hall Welding Corp., 212 Dana Av., N. E., Warren, O.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor-Winfield Corp., 1052 Mahoning Av., N. W., Warren, O.
Technical Processes Div., Colonial Alloys Company, Ridge Av. & Crawford St., Philadelphia 29.
Tecumseh Products Co., Tecumseh, Mich.
Temtrol Mfg. Co., 7136 W. Jefferson Av., Detroit.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham 2, Ala.
Tennessee Enamel Mfg. Co., 4104 Park Av., Nashville 9, Tenn.
Tennessee Products Corp., American Natl. Bk. Bldg., Nashville, Tenn.
Tenney Engineering Co., 26 Avenue B, Newark, N. J.
● Thatcher Furnace Company, Centre St., Garwood, N. J.
● Thermac Co., 800 E. 108th St., Los Angeles 2.
Thermador Electrical Mfg. Co., Inc., 5119 District Blvd., Los Angeles 22.
Thermal Industries, Indio, Calif.
Therminsul Corp., 1603 Fulford St., Kalamazoo, Mich.
Thermo-Aire Division, Evans Products Company, Plymouth, Mich.
Thermoid Rubber Div. of Thermoid Co., Whitehead Rd., Trenton 6. N. J.
Thomas Machine Manufacturing Co., Etna Branch P. O., Pittsburgh 23.
Thompson Mfg. Co., A. F., 1040 Vernon St., Huntington, W. Va.
Thompson & Son Co., Henry G., 100 James St., New Haven 5, Conn.
Thompson & Company, 1085 Allegheny Av., Oakmont (Pittsburgh Dist.), Pa.
Thomson Electric Welder Company, 161 Pleasant St., Lynn, Mass.
Thor Metal Products Co., Inc., Box 118, Eastwood Station, Syracuse, N. Y.
Thrush & Company, H. A., Peru, Ind.
Tierney Rotor Ventilator Co., 239 4th Av., S., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Tiffin Eaves Trough Clamp Co., 25 Miami St., Tiffin, Ohio.
Timken Silent Automatic Div., Timken-Detroit Axle Co., 100 Clark Av., Detroit 32.
● Tinit Manufacturing Co., Inc., P. O. Box 794, Denver 1, Colo.
Tinnerman Products, Inc., 2065 Fulton Rd., Cleveland 13.
Tishken Products, Livernois & Van Buren Sts., Detroit, Mich.
Titan Valve & Mfg. Co., 9913 Elk Av., Cleveland.
Titeflex, Inc., 500 Frelinghuysen Av., Newark 5, O.
Toch Brothers, Inc., 2600 Richmond Ter., Elm Park, S. I., N. Y.
Toledo Heater Company, 25 S. St. Clair St., Toledo 4, Ohio.
● Topflight Tool Co., Huber Building, York 4, Pa.
Torit Manufacturing Co., 292 Walnut St., St. Paul 2.
Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Torrington Mfg. Co., 70 Franklin St., Torrington, Conn.
Totten Co., Grant, 1215 McKinley Av., S. W., Canton 4, Ohio.
Townsend Co., New Brighton, Pa.
● Trade-Wind Motorfans, Inc., 5725 S. Main St., Los Angeles 37.
Trane Co., The, La Crosse, Wis.
Tremont Nail Company, Box 111, Wareham, Mass.
● Triangle Manufacturing Co., 388 Division St., Oshkosh, Wis.
Trindl Products, Ltd., 17 E. 23rd St., Chicago 16.
Triplex Mfg. Co., Peru, Ind.
Tri-State Heating Supply Co., 234-236 Murray St., Fort Wayne 5, Ind.
Tropic-Air Stoker Co., 2017 Indiana Way, N. E., Canton 5, O.
Tropical Paint & Oil Co., 1244-86 W. 70th St., Cleveland.
Trumbull Electric Mfg. Co., Woodford Av., Plainville, Conn.
Trufio Fan Co., 523 Main St., Harmony, Pa.
Tru-Mac Mfg. Co., 24 Woburn St., Reading, Mass.
Truscon Laboratories, Caniff & Grand Trunk R. R., Detroit 11.
Truscon Steel Co., Albert St., Youngstown 1, O.
Tubular Rivet & Stud Co., Wollaston 70, Mass.
Turco Products, Inc., 6135 S. Central Av., Los Angeles 1.
Turner & Seymour Mfg. Co., Lawton St., Torrington, Conn.
Turner Brass Works, 821 Park Av., Sycamore, Ill.
Tuthill Pump Company, 939 E. 95th St., Chicago 19.
● Tuttle & Bailey, Inc., Corbin Av., New Britain, Conn.
Twentieth Century Heating & Ventilating Co., 96 Ira Av., Akron 1, Ohio.

U

Uehling Instrument Co., 473 Getty Av., Paterson 3, N. J.
Unified Air Conditioner Co., 322 W. Michigan St., Duluth, Minn.
U-Ni-Matic Heating Systems, Inc., 1303 W. Slauson Av., Los Angeles 44.
Union Mfg. Co., 297 Chestnut St., New Britain, Conn.
● Union Manufacturing Co., Inc., 6th & Washington Sts., Boyertown, Pa.
Unique Manufacturing Co., Inc., 218 W. Walton St., Chicago 10.
United-Carr Fastener Corporation, 31 Ames St., Cambridge 42, Mass.
United Chromium, Incorporated, 51 E. 42nd St., New York City 17.
United Cork Companies, Central Av. & N. J. Central R. R., Kearny, N. J.
United Electric Controls Co., 69 "A" St., South Boston 27.
United Metal Hose Co., Inc., 36-01 43rd Av., Long Island City 1, N. Y.
● U. S. Air Conditioning Corp., Como Av. S. E. at 33rd, Minneapolis 14.
U. S. Electrical Motors, Inc., 200 E. Slauson Av., Los Angeles 54.
United States Electrical Tool Co., 1050 Findlay St., Cincinnati 14.
U. S. Expansion Bolt Co., Inc., P. O. Box 827, York, Pa.
U. S. Gutta Percha Paint Company, 35 Dudley St., Providence 1, R. I.
United States Gauge Div. American Machine & Metals, Inc., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6.
U. S. Machine Corporation, Lebanon, Ind.
United States Mineral Wool Co., 10 S. LaSalle St., Chicago 3.
United States Radiator Corp., 1500 United Artists Bldg., Detroit 31.
● United States Register Co., Burnham St., Battle Creek, Mich.
U. S. Rock Wool Co., 40 S. Main, Salt Lake City 1.

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United States Rubber Co., 1230 Sixth Av., New York 20.
United States Steel Corp., 436 Seventh Av., Pittsburgh 30.
U. S. Stoneware Company, Akron, Ohio and 60 E. 42nd St., New York City 17.
United States Stove Company, Cedar Av., South Pittsburg, Tenn.
Universal Air Filter Corp., 332 W. Michigan St., Duluth 2, Minn.
Universal Blower Co., 1090 S. Adams Av., Birmingham, Mich.
Universal Cooler Div., International Detrola Corp., 299 Joseph St., Marion, O.
Universal-Cyclops Steel Corporation, Drawer 153, Bridgeville, Pa.
Universal Gypsum & Lime Co., 111 W. Washington St., Chicago.
Universal Metal Products, 2940 E. Olympic Blvd., Los Angeles 23.
Universal Welder Corporation, 735 Carnegie Av., Cleveland 15.
Universal Zonolite Insulation Co., 135 S. LaSalle St., Chicago 3.
Uno Ventilator Co., 565 Lincoln Av., Cliftondale Station, Saugus, Mass.
Utica Products, Incorporated, Utica 4, N. Y.
Utility Appliance Corporation, 4851 S. Alameda St., Los Angeles 11.

V

Vacuum Gas Appliances Div. Union Fork & Hoe Co., Rome, N. Y.
Vacuum Gas Burner Corp., 115 N. Union St., Olean, N. Y.
Vallas, Lionel, 2850 W. Lake St., Chicago 12.
Valley Electric Co., 4221 Forest Park, St. Louis.
Van Dorn Electric Tool Co., Towson 4, Md.
Van Noorden Co., E., 100 Magazine St., Boston 19.
Van Packer Corporation, 1260 Field Bldg., Chicago.
Van's Gas Burner Service, 20429 Elkhart, Detroit 24.
Van Tuyl & Associates, J. E., B of L E Bldg., Cleveland.
Vendor Slate Co., Inc., P. O. Box 204, Nazareth, Pa.
Vent-O-Lite Co., 4230 W. Taylor St., Chicago 24.
Vermont Structural Slate Co., Inc., P. O. Box 98, Fair Haven, Vt.
• Verson Allsteel Press Co., 1351 E. 93rd St., Chicago 19.
Vibration Eliminator Co., 10-28 47th Av., Long Island City 1, N. Y.
Victor Electric Products, Inc., 2950 Robertson Road, Cincinnati 9.
Victor Oil Burner Mfg. Co., 250 Pleasant St., Hartford 3, Conn.
Victory Mfg. Co., Plastics Dev. Div., 1105 Fair Oaks Av., South Pasadena, Calif.
• Viking Air Conditioning Corp., 5600 Walworth Av., Cleveland 2.
Viking Manufacturing Corp., 1747 Chester Av., Cleveland 14.
Viking Pump Co., 410 State St., Cedar Falls 1, Ia.
Viking Shear Co., 1063 W. 19th St., Erie, Pa.
Vilter Mfg. Co., 2217 S. First St., Milwaukee 7.
Virginia Rubatex Div., Great American Industries, Inc., Bedford, Pa.
• Vital Products Mfg. Co., 7500 Quincy Av., Cleveland 4.
Volcano Burner Corp., 3612 E. Tremont Av., New York 61.
Voss Co., J. H. H., 785 E. 144th St., Cor. Wales Av., New York City 54.
Vulcan Electric Co., Div. Consolidated Electric Lamp Co., Inc., 88 Holten St., Danvers, Mass.
Vulcan Radiator Co., 26 Francis Ave., Hartford 6, Conn.

W

Wade Manufacturing Co., 77 N. State St., Elgin, Ill.
Wagner Electric Corp., 6400 Plymouth Av., St. Louis 14.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Waldorf Heater Company, 1421 Chestnut St., Philadelphia 2.
Wales-Strippit Corporation, 345 Payne Ave., North Tonawanda, N. Y.
• Walker Mfg. & Sales Corp., 1711-1717 Penn St., St. Joseph 1, Mo.
Wall Chemicals Div., Liquid Carbonic Corp., 3100 S. Kedzie Av., Chicago 23.
Walsh Refractories Corp., 4070 N. First St., St. Louis 7.
Ward Co., Edgar T., Inc., 7777 W. Lake St., River Forest, Ill.
Ward Heater Co., 1800 W. Washington Blvd., Los Angeles 7.
Ward Leonard Electric Co., 37 South St., Mt. Vernon, N. Y.
Ward Machinery Co., 564 W. Washington Blvd., Chicago.
Warner Bros. Co., Bridgeport 2, Conn.
Wasco Flashing Co., 86 Broadway, Cambridge 42, Mass.
Washington Steel Company, Washington, Pa.
Washington Stove Works, 3402 Smith St., Everett, Wash.
• Waterloo Register Div., Associated Manufacturers, Inc., 600 Anita St., Waterloo, Ia.
Watco Engineering, Inc., 2200 Scranton Rd., Cleveland 13.
Water Cooling Corporation, 71 Nassau St., New York City 7.
Water Cooling Equipment Corp., New Hampshire Av. & Weber Rd., Affton Sta., St. Louis 23.
• Waterman-Waterbury Co., 1122 Jackson St., N. E., Minneapolis 13.
Wattenamel Co., 7400 Archer Av., Summit, Ill.
Waukesha Lime & Stone Co., P. O. Box 27, Waukesha, Wis.
Waverly Heating Supply Co., 31 Union St., Boston 8.
Wayne Home Equipment Co., Inc., 801 Glasgow Av., Fort Wayne 4, Ind.
Weatherall Engineers, Inc., 3 Friendship St., Providence 3, R. I.
Webb Co., Jervis B., Joy Rd. & Alpina Av., Detroit.
Webber Co., A. R., 780 State St., New Haven, Conn.
• Webster Electric Co., DeKoven & Clark Sts., Racine, Wis.
Webster Engineering Co., 419 W. 2nd St., Tulsa, Okla.
• Weirton Steel Co., Weirton, W. Va.
Weiss & Co., H., 113-115 Mercer St., New York City.
Weksler Thermometer Corp., 52 W. Houston St., New York 12.
Weldex, Inc., 7326 McDonald Av., Detroit 10.
Welding Machines Manufacturing Company, 17325 Lamont Av., Detroit 12.
Welding Sales & Engineering Company, 8750 Grinnell Av., Detroit 13.
Wells Mfg. Corp., 1818 Wilson Av., Three Rivers, Mich.
Werner Co., Inc., R. D., 295 Fifth Av., New York 16.
Western Air Devices, 1349 E. Vernon Av., Los Angeles 11.
Western Blower Co., 1800 Airport Way, Seattle 4, Wash.
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.
• Western Engineering & Mfg. Co., 1726 E. Washington Blvd. Los Angeles 21.
Western Felt Works, 4029 Ogden Av., Chicago 23.
Western Furnaces, Inc., 950 Commerce St., Tacoma 2, Wash.
Western Mineral Products Co., 2602 Ed Creighton Av., Omaha 1, Nebr.
Western Precipitation Corp., 1016 W. 9th St., Los Angeles 15.
Western Reserve Laboratories, 1440 W. Third St., Cleveland 13.
Western Rock Wool Corp., P. O. Box 545, Huntington, Ind.
Westinghouse Electric Corporation, East Pittsburgh 30, Bloomfield, N. J., and Cleveland.
Weston Electrical Instrument Corp., 614 Frelinghuysen Av., Newark 5, N. J.
Westwick & Son, Inc., John, Claude & Meeker Sts., Galena, Ill.
West Wind Corporation, 1800 Airport Way, Seattle 4.
Wheelco Instruments Co., 847 W. Harrison St., Chicago 7.
Wheeling Corrugating Co., Wheeling Steel Bldg., Wheeling, W. Va.
• Wheeling Furnace Corporation, Martins Ferry, Ohio.
Wheeling Steel Corp., Wheeling Steel Bldg., Wheeling, W. Va.
• White Mfg. Co., 2362 University Av., St. Paul, Minn.
• White-Rodgers Electric Co., 1209 Cass Ave., St. Louis 6.
Whiting Corp., 157th St. & Lathrop Av., Harvey, Ill.
Whiting Stoker Sales Co., 11 S. LaSalle St., Chicago 3.
Whitlock Mfg. Co., 100 South St., Hartford 1, Conn.; 37 W. Van Buren St., Chicago 5.
• Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.
• Whitney Metal Tool Co., 91 Forbes St., Rockford, Ill.
Whitty Company, Inc., 86 Western Av., Boston 34.
Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp., 361 Delaware Av., Buffalo 2.
Wiedemann Machine Co., 1815 Sedgley Av., Philadelphia 32.
Wilbur & Williams Co., 43 Leon St., Boston 15.
Wilder Mfg. Co., 2300 S. Main St., Niles, Ohio.
Wiley Manufacturing Co., 4091 Beaufait, Detroit.
Wilhelm Co., A., Div. The Glidden Co., 3rd & Bern Sts., Reading, Pa.
Will-Burt Co., 1153 N. Main St., Orrville, Ohio.
Williams, Inc., F. C., 8850 Hubbell Av., Detroit 27.
• Williams Oil-O-Matic Div., Eureka-Williams Corporation, 1201 E. Bell, Bloomington, Ill.
• Williams Radiator Company, 3115 Beverly Blvd., Los Angeles 4.
• Williams-Wallace Co., 160 Hooper St., San Francisco 7.
• Williamson Heater Co., 2558 Marburg Av., Cincinnati 9, Ohio.

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● Willis Steel Corporation, 156 N. Academy St., Galesburg, Ill.
Willoughby Machine & Tool Co., 15 Second St., Willoughby, Ohio.
Willson Products, Inc., 248 Thorn St., Reading, Pa.
Will-Weld Mfg. Co., Inc., 600 S. 15th St., Omaha 2, Nebr.
● Wilson & Co., Inc., 4100 S. Ashland Av., Chicago 9.
● Wilson, Inc., Grant, 141 W. Jackson Blvd., Chicago 4.
● Wilson, K. R., 215 Main St., Buffalo 3.
Wilster, Inc., 5700 Detroit Av., Cleveland 2.
Wind-Way Fan & Ventilator Co., 527 St. Joseph St., New Orleans.
Wing Mfg. Co., L. J., 154 W. 14th St., New York 11, N. Y.
Winkler & Sons., Inc., A. E., 2337 N. 31st St., Milwaukee 10.
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● Wise Furnace Co., 101 Lincoln St., Akron 8, O.
● Wiss & Sons Co., J., 11-45 Littleton Av., Newark 7.
Wittenmeier Machinery Co., 850 N. Spaulding Av., Chicago 51.
● Wodack Electric Tool Corp., 4627 W. Huron St., Chicago 44.
Wolfe-Kote Co., 705 Center Av., Sheboygan, Wis.
Wolff and Company, Benjamin, 58th St. at Seeley Av., Chicago.
Wolverine Tube Div. Calumet and Hecla Consolidated Copper Co., 1419 Central Av., Detroit 9.
Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.
Wood Industries, Inc., Gar, Heating Div., Wayne, Mich.
Wood Steel Co., Alan, P. O. Box 112, Conshohocken, Pa.
Wood Mfg. Co., Inc., John, Conshohocken, Pa.
Wood's Sons Co., T. B., 1275 Fifth Av., Chambersburg, Pa.
Woolley Engineering Co., 411 Curtis Bldg., Detroit 2.
Worcester Brush & Scraper Co., Div. Mason Worcester Co., 38 Austin St., Worcester 2, Mass.
Worcester Pressed Steel Co., 99 Barber Av., Worcester 6, Mass.
Worsham Company, Incorporated, 7329 Lohmeyer, St. Louis 17.
Worthington Pump & Machinery Corp., Harrison, N. J.
Wright Manufacturing Division, American Chain & Cable Company, Inc., Bridgeport, Conn.
● Wysong and Miles, 625 Fulton St., Greensboro, N. C.
Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22.

X

X-Pando Corp., 43-15 36th St., Long Island City 1, N. Y.
XXth Century Heating & Ventilating Co., 96 Ira Av., Akron, O.

Y

Yale & Towne Mfg. Co., Philadelphia Div., 4531 Tacony St., Philadelphia.
Yardley Plastics Company, 142 Parsons Av., Columbus 15, O.
Yardley Venetian Blind Co., 138 Parsons Av., Columbus 15, O.
Yarnall-Waring Company, Chestnut Hill, Philadelphia 18.
Yeomans Bros. Co., 1433 Dayton St., Chicago 22.
Yoder Co., 5500 Walworth Av., Cleveland 2.
York Corrugating Co., Adams St. & W M RR., York, Pa.
York Corporation, Roosevelt Av., York, Pa.
York Electric Tool Co., 52 S. Duke St., York, Pa.
York-Heat Div. York-Shipley, Inc., Jessop Place and P. R. R., York, Pa.
York Electric and Machine Company, 1241 W. King St., York, Pa.
Young Bertke Co., 1004-1014 Hulbert Av., Cincinnati 14.
Young Radiator Co., 709 Marquette St., Racine, Wis.
Young Regulator Co., 5209 Euclid Av., Cleveland 3.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O.

Z

Zapon Div. Atlas Powder Co., North Chicago, Ill.
Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark 5.
Zenith Electric Company, 152 W. Walton St., Chicago 10.
Zephyr Gas Burner Company, 520 W. Eight Mile Rd, Detroit (Ferndale), Mich.
● Zink Co., John, 4401 S. Peoria St., Tulsa 1, Okla.
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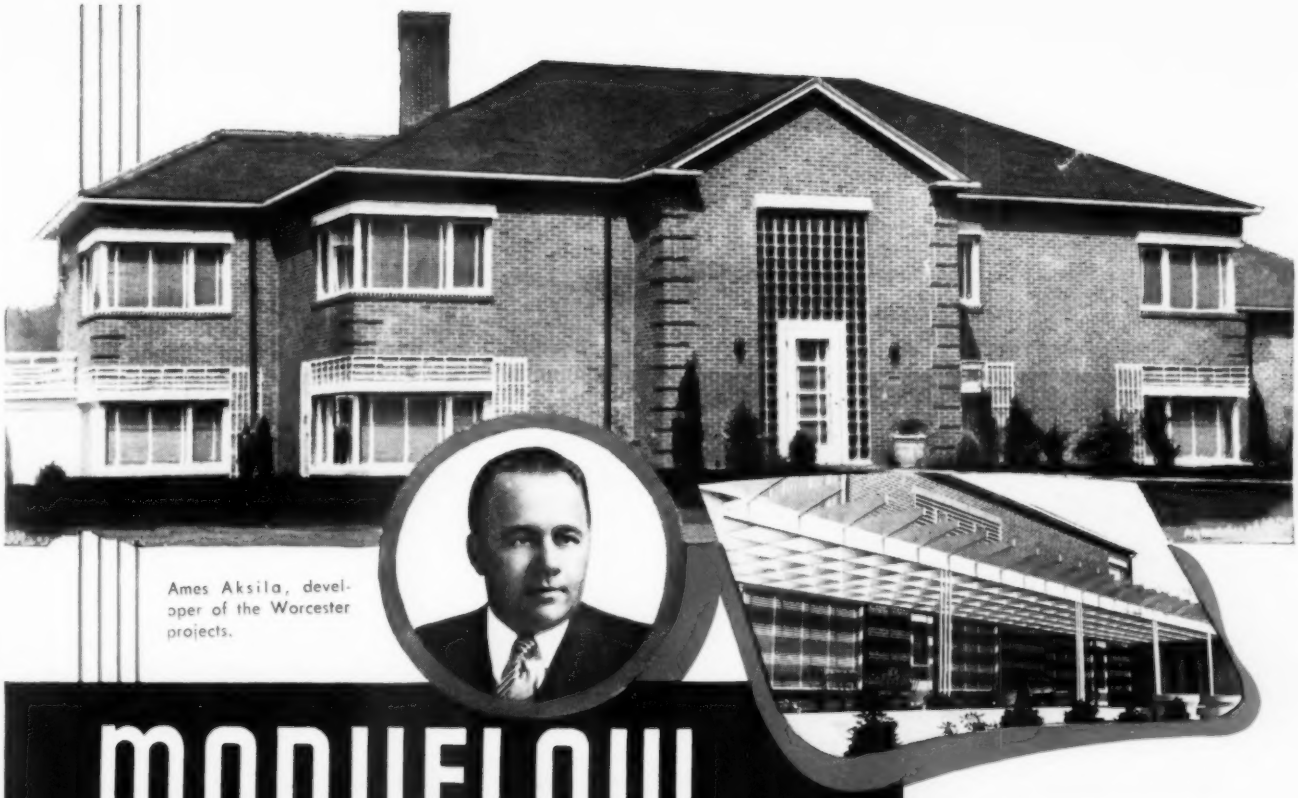

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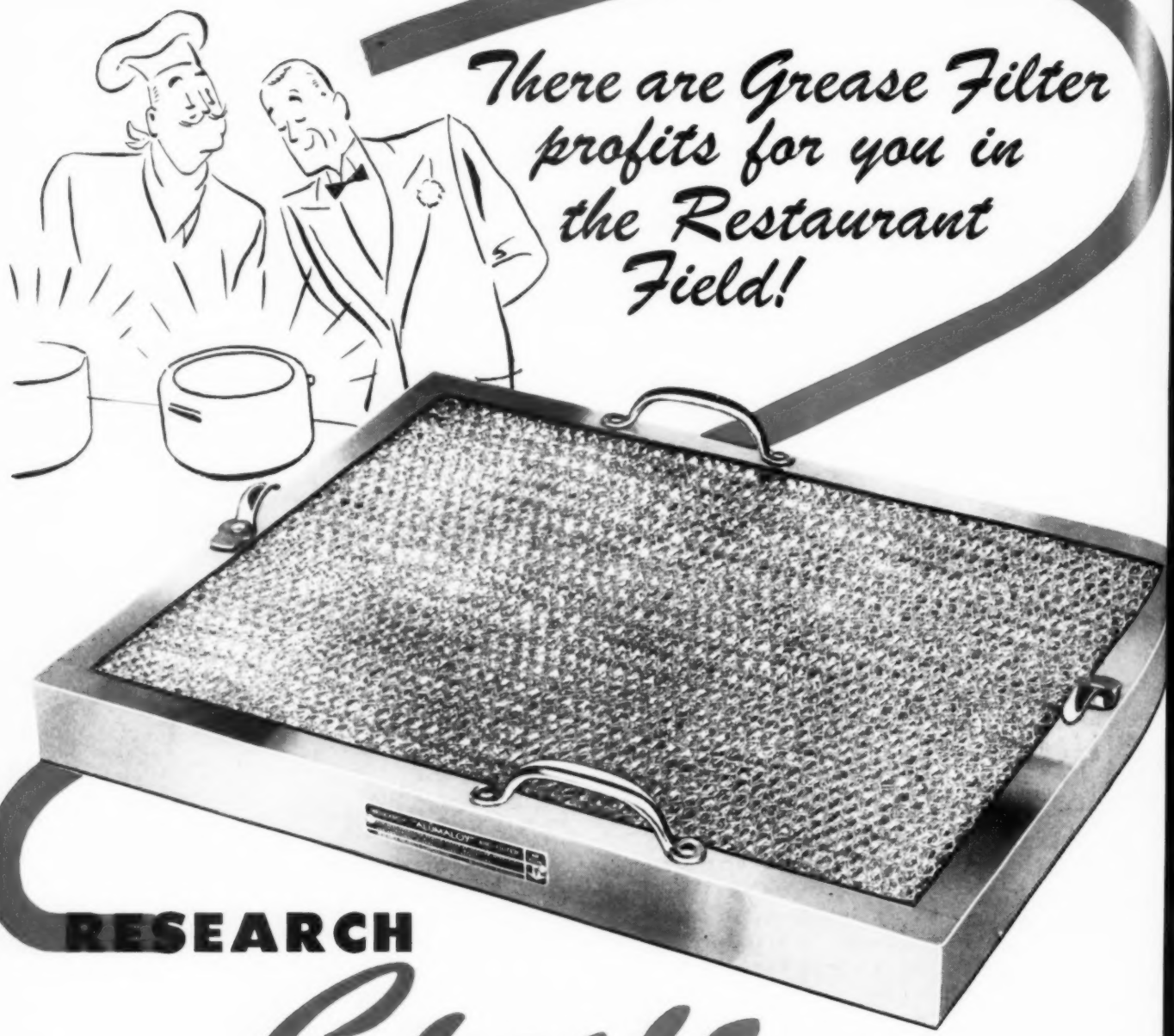

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